STRENGTHENING MARYLAND'S HEALTH CARE WORKFORCE

Developing a robust corps of health professionals serving Maryland will depend not only on careful targeting of additional resources and on changes to state, System, and university policies, but also on deeper collaboration among the institutions preparing Maryland's front-line providers and on our willingness and ability to develop, sustain, and innovate programs that place our providers among the country's very best.

USM HEALTH CARE WORKFORCE WORKING GROUP

OCTOBER 2018

WORKING GROUP MEMBERS

Jay Perman (chair)	President *University of Maryland, Baltimore*
Michelle Gourdine	Regent *University System of Maryland*
Juliette Bell	President *University of Maryland Eastern Shore*
Janet Dudley-Eshbach	President *Salisbury University*
Ronald Nowaczyk	President *Frostburg State University*
Kim Schatzel	President *Towson University*
Kurt Schmoke	President *University of Baltimore*
Maria Thompson	President *Coppin State University*
Joann Boughman	Senior Vice Chancellor for Academic Affairs *University System of Maryland*

TABLE OF CONTENTS

PREFACE

There has been no dearth of attention paid to ensuring that Maryland has a health care workforce sufficient to care for a population that is rapidly aging, that suffers increasingly from chronic illness, and that enjoys greater access to primary care due to coverage expansions.

Statewide groups have been charged with recommending ways to increase the number of health care workers in Maryland and to better align their distribution with area need. Recommendations have included developing and funding nontraditional paths in health care workforce development; developing new and expanding existing academic programs; building and funding innovative models of clinical supervision; enlarging the health care faculty pool; expanding loan assistance and other programs that attract workers to underserved areas; reviewing licensure, credentialing, and tort litigation to remove practice barriers; creating a re-entry program for health professionals who have stopped practicing; and improving care compensation and reimbursement models.[1] [2]

In support of these efforts, the University System of Maryland (USM) Board of Regents and Chancellor Robert L. Caret, PhD, convened in summer 2016 this Health Care Workforce Working Group. The group's goal is to investigate the role of USM in preparing a robust and highly trained health care workforce for the state; to identify factors that limit the System's ability to supply that workforce; and to recommend ways to enlarge our production capacity and enhance the quality of our academic programs.

USM's 11 universities offer several dozen undergraduate and graduate health care programs and award more than 3,400 degrees and certificates in the health professions, constituting a full two-thirds of the health credentials conferred in Maryland each year.[i] While USM degree production in high-need health professions is climbing—a 40 percent climb, in fact, since 2009—that production as a share of workforce demand continues to shrink.

Compounding the fact that health care demand reliably outpaces practitioner supply is the fact that increasing our supply—that is, enrolling and training more students—is notoriously difficult and costly in the health professions. Health care education requires expensive facilities and equipment (and space for both). It requires adequate opportunities for clinical training. It requires relationships with hospitals and health care partners who are asked to place far more students in experiential programs than they can reasonably accommodate. It requires a rich pool of expert faculty who can often earn more money in clinical settings than in academic ones. Most importantly, it requires a commitment to the highest standards of quality, so that the workforce we prepare is one that will measurably improve individual and population health in every part of this state.

The Health Care Workforce Working Group discussed these and other considerations for developing a robust corps of health professionals. For this report, the working group focused on four areas of urgency in health care education: nursing articulation and collaboration, clinical partnerships and placements, interprofessional education, and simulation facilities. Each topic area was assigned to a subgroup that examined the issue and offered recommendations.[ii]

[i] At the bachelor's degree level or above

[ii] The Nursing Articulation and Collaboration, Simulation Facilities, and Interprofessional Education subgroups further divided their work into two parts, with one group of people assessing challenges and another recommending solutions. In these chapters, the people undertaking each scope of work are represented in one combined membership list. Membership lists indicating which people worked on challenges and which worked on solutions are available to readers who wish to review them.

NURSING ARTICULATION AND COLLABORATION

Certainly nursing shortages are a concern nationwide and in Maryland. According to a 2016 U.S. Department of Health and Human Services report, Maryland is one of four states that will experience a shortage of 10,000 or more registered nurses (RNs) by 2025.[3] [iii] In 2015, USM graduated only 41 percent of the nursing students needed to fill open jobs in Maryland, and all nursing programs combined met less than two-thirds of the need statewide.[4] Additionally, a rapidly growing share of employers now requires that RNs hold at least a bachelor's degree, meaning that USM will be challenged to educate a considerable share of the incoming—and existing—RN workforce.

An urgency for more—and more highly trained—nurses obligates us to explore ways to increase nursing enrollment at all degree levels; to investigate better articulation among programs and greater collaboration among institutions; and to consider new approaches to growing and sharing our training facilities and faculty corps.

Our recommendations focus on expanding enrollment in entry-level and graduate nursing programs in order to shrink Maryland's acute nursing workforce shortages. Expanding nursing enrollment would, in turn, depend on adding resources and faculty at each USM institution (with a nursing program) to accommodate more students; enlarging the availability of clinical placements so that students can complete the training they need; and boosting licensure exam pass rates so that graduating students can practice in Maryland.

CLINICAL PARTNERSHIPS AND PLACEMENTS

Central to the education of health professionals is the clinical experience. These initial clinical experiences are generally accomplished in partnership with local and regional hospitals and health care systems, which, in many cases, are not directly affiliated with the educational institutions seeking student placements. In recent years, the difficulty of placing students in these clinical settings has increased considerably, and it has developed into a primary factor inhibiting the expansion of USM health education programs.

We provide an overview of clinical placement needs across critical areas (e.g., nursing, physical therapy) and consider how we deepen our relationships with area health care partners and identify opportunities to collaborate in students' experiential training; these opportunities include a central role for the University of Maryland Medical System. We also identify the major barriers to increasing clinical placements, as well as occasions to share resources across USM in a way that expands placements without unnecessarily inflating costs.

Our recommendations center on ways that USM can expand the number of clinical rotations available to USM students in critical practice areas; enhance the training experience for our clinical partners and the students they place; and collaborate as a System to improve the efficiency of the placement process and reduce the administrative burden on preceptors.

[iii] A more recent DHHS report (2017) puts Maryland's nursing workforce at a surplus of 12,100 RNs by 2030.

SIMULATION FACILITIES

Simulation replaces and amplifies authentic experiences with guided ones, replicating substantial aspects of the real world in an immersive and interactive way.[5] Using simulation "reduces risks for patients and for learners, allows repeated skills training, and facilitates the transfer of classroom knowledge" to the patient setting.[6] Simulation is also imperative for high-quality interprofessional education, allowing students to work together to develop professional skills and attitudes and resolve practice-based dilemmas.[7]

And so, of all the facility-related constrictions experienced across USM, an insufficiency of simulation facilities is the most consequential. We must bring our clinical health care partners and other stakeholders—public and private—into this discussion of how we use and share available simulation facilities, and where such sharing is still inadequate for Maryland's training needs.

Our recommendations focus on establishing a center of excellence in simulation education, developing a mobile simulation resource, and expanding existing simulation facilities in three locations throughout Maryland that will most easily serve all USM institutions.

INTERPROFESSIONAL EDUCATION

From the outset, this working group was concerned not only with producing an adequate number of health professionals, but an adequate number of *team-oriented* health professionals. The premise of interprofessional education (IPE) is that health care practitioners trained to work in interdisciplinary teams—to cooperate, communicate, and integrate care—will improve care quality (especially for chronic illness and for patients with social challenges), lower costs, shrink the number and length of in-patient stays, and reduce medical errors.[8] It is not lost on this working group that IPE, done well, could actually alleviate Maryland's health care workforce shortages.

While universities within USM have launched IPE initiatives, we have not undertaken a truly Systemwide approach to IPE, despite a structure well-suited for doing so. We must consider how USM provides IPE in simulated clinical environments, offers IPE exercises using standardized patient facilities, and expands interprofessional clinical experiences for students.

Our recommendations center on scaling effective IPE programs Systemwide, with an emphasis on those that optimize student learning in three IPE domains, and supporting inter-institutional IPE research that advances curriculum design and faculty development.

MOVING FORWARD

Of course, these are not the only considerations affecting USM's ability to supply the state with the health professionals it needs. The working group has discussed several additional issues central to preparing Maryland's 21st century health care workforce.

- How do we shrink shortages in primary care and other areas determined to be most acute in the state and most damaging to Marylanders' health and wellness?
- How do we increase the pool of health professionals in Maryland's medically underserved areas?
- How do we cultivate diversity in Maryland's health care workforce, so that our practitioners better reflect the populations they serve?
- How do we ensure a sufficiency of teaching faculty in the health sciences?
- Have we adequately exploited opportunities for program articulation and institutional collaboration—with community colleges and with each other?
- Are Maryland's P–20 pipeline efforts having an impact on the number of students enrolling in health sciences programs and how do we strengthen pipeline outcomes?
- Have we adequately examined our academic programs and identified opportunities for improvements in program quality and course design?
- Do our classroom and clinical training practices reflect the changing nature of the health care delivery system, including a central role for case management in team-based care?
- How do we ensure a sufficiency of facilities available for training our health sciences students?
- Do our technology systems and practices adequately support our health programs, and do they enable innovation and encourage collaboration?
- What opportunities are there for shared resources across the System so that we can expand health program enrollment without unnecessarily inflating costs?
- How can we use stackable credentials to create career pathways into the health professions and to help health professionals progress up the career ladder?

These challenges must figure into a comprehensive examination of USM's role in Maryland's health care workforce development, and we recommend that the working group remain convened to address them. We are convinced that our success will depend not only on careful targeting of additional resources and on changes to state, System, and university policies, but also on deeper collaboration among the institutions working to prepare Maryland's front-line providers and on our willingness and ability to develop, sustain, and innovate programs that place our providers among the country's very best.

WORKFORCE PRODUCTION AND DEMAND

Despite the dramatic growth in degree production within USM, the growth in workforce needs has kept pace with or exceeded the System's production increases.

The rapid expansion of Maryland's health care sector is straining the ability of our USM universities to meet accelerating demand.

This chapter provides data on USM's production of graduates in the health professions and compares that data to in-state employer demand for those graduates. The chapter also details the System's market share in terms of the state's *overall* production of health professionals, offering context for how effectively USM has met demand over the last decade and revealing where challenges remain.

The workforce demand data in this chapter are based on occupational projections provided by the Maryland Department of Labor, Licensing and Regulation to the U.S. Department of Labor. The data on student enrollment and degree production are based on institutional reporting to the Maryland Higher Education Commission. These two data sets are combined by USM to conduct periodic studies (in 2005, 2009, and 2015) on workforce production and demand. These studies formed the evidentiary basis for the report of the Governor's STEM Task Force in 2009[iv] and have been used extensively throughout the state to influence appropriate academic program development.

MARYLAND IS A CENTER OF DEMAND IN HEALTH CARE

An estimated 20 percent of all job openings in Maryland requiring a bachelor's degree or higher (nearly 9,000 per year) are in the health care workforce.[v] This is projected to be the case through at least 2023. Demand for health care workers is not only robust; it is growing. Job openings in the health professions have climbed by nearly two-thirds over the last decade, and most health care occupations are experiencing worker shortages.

This supply gap is not only substantial as a portion of Maryland's economy; it is very high, as well, within a national context. Among Maryland's competitor states,[vi] Maryland has the most openings per capita in virtually every major health care workforce category. This includes clinicians such as nurses, physicians, pharmacists, physical therapists, and occupational therapists. It includes medical and health services managers. It includes medical social workers, where Maryland ranks near the top nationally in job openings. The demand extends to the workforce typically educated at the bachelor's or associate degree level, including lab technologists and dental hygienists.

As just one example, for every physician job open in Maryland, there are 9,600 state residents. For Massachusetts, the ratio is one physician opening per 17,000 residents, and for North Carolina, New Jersey, and New York, it is one physician opening per 22,000–23,000 residents. Taken together, the figures suggest that *Maryland has the highest health care workforce demand* of any (relatively rich) state in the country, and by a good margin.

The obvious question is *why*. Initial research indicates that multiple drivers may be creating this disproportionate demand in Maryland. These drivers include Maryland's high concentration of world-class health care research and clinical settings (University of Maryland Medical System, Johns Hopkins Medicine, National Institutes of Health); funding formulas tied to the Affordable Care Act that favor deployment of many primary care workers; and the fact that Maryland acts as a health care provider for the growing retired population in Delaware, for rural populations in West Virginia and Pennsylvania, and for those living and working in Washington, DC. Indeed, Maryland may be moving into an expanded role where our health care workforce serves populations beyond Maryland's borders.

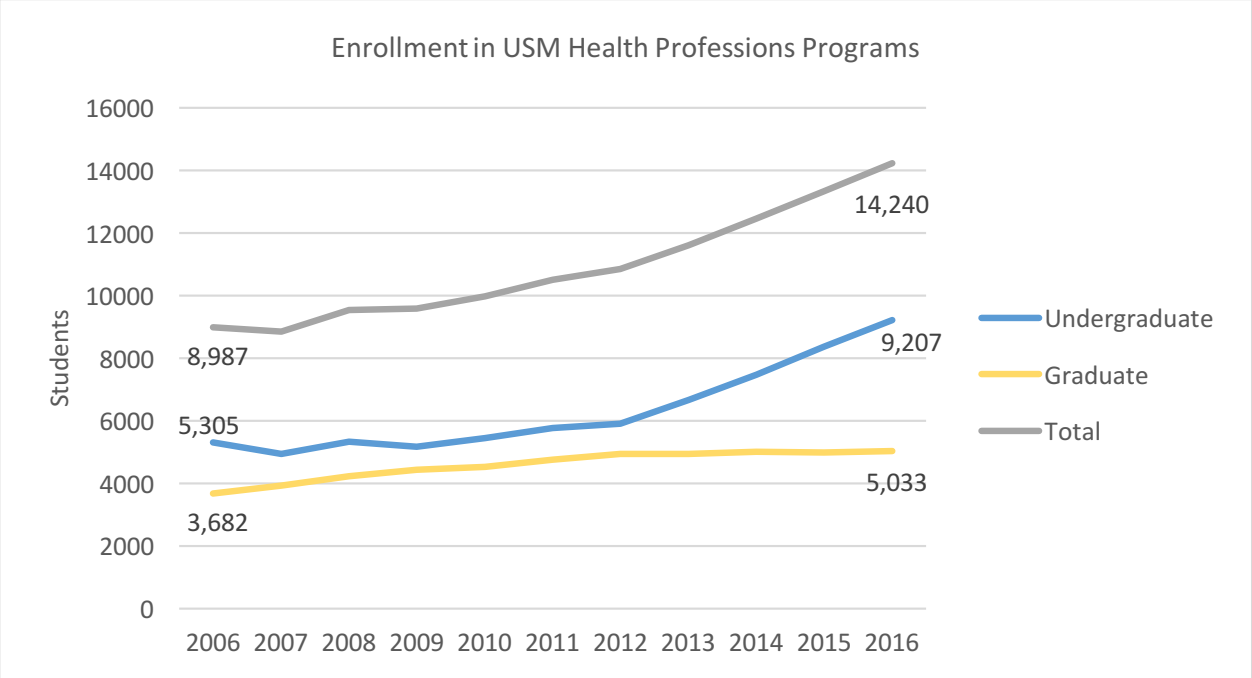
[iv] *Investing in STEM to Secure Maryland's Future*
[v] The "health care workforce" does not include support positions ancillary to the health professions, such as those in information technology and many in the business services.
[vi] California, Massachusetts, Minnesota, North Carolina, New Jersey, New York, Ohio, Pennsylvania, Virginia, and Washington

USM HEALTH PROFESSIONS ENROLLMENT AND DEGREE PRODUCION HAVE INCREASED DRAMATICALLY

Enrollment in USM's health professions majors reached a record level of more than 14,000 students in fall 2016, representing a substantial increase over a decade ago, when enrollment stood at nearly 9,000. The most substantial growth has occurred since fall 2012, when the University of Maryland University College began adding health professions students rapidly, particularly in the area of health services management. Enrollment trends are illustrated in Figure W–1.

Nursing is, by far, the dominant field in USM's health professions enrollment, constituting 42 percent of total enrollment and 53 percent of undergraduate enrollment. Nursing is also the most widely represented professional degree program among System institutions; seven USM universities offer undergraduate nursing degrees.[vii] Nursing is the highest demand occupation for any degreed profession and, in fact, the highest demand occupation in Maryland—regardless of education level.

Figure W–1. Health Professions Enrollment at University System of Maryland Institutions



Other areas of high enrollment include health services management (particularly at the undergraduate level), medicine, pharmacy, and dentistry. Many other clinical fields—including physical therapy, occupational therapy, and speech-language pathology—are well represented, but with slightly lower enrollment levels. With few exceptions,[viii] USM offers degree programs in the health professions carrying substantial demand in Maryland. See Table W–1 for a breakdown of student enrollment by USM institution, health care program, and degree level (undergraduate or graduate/first professional degree).

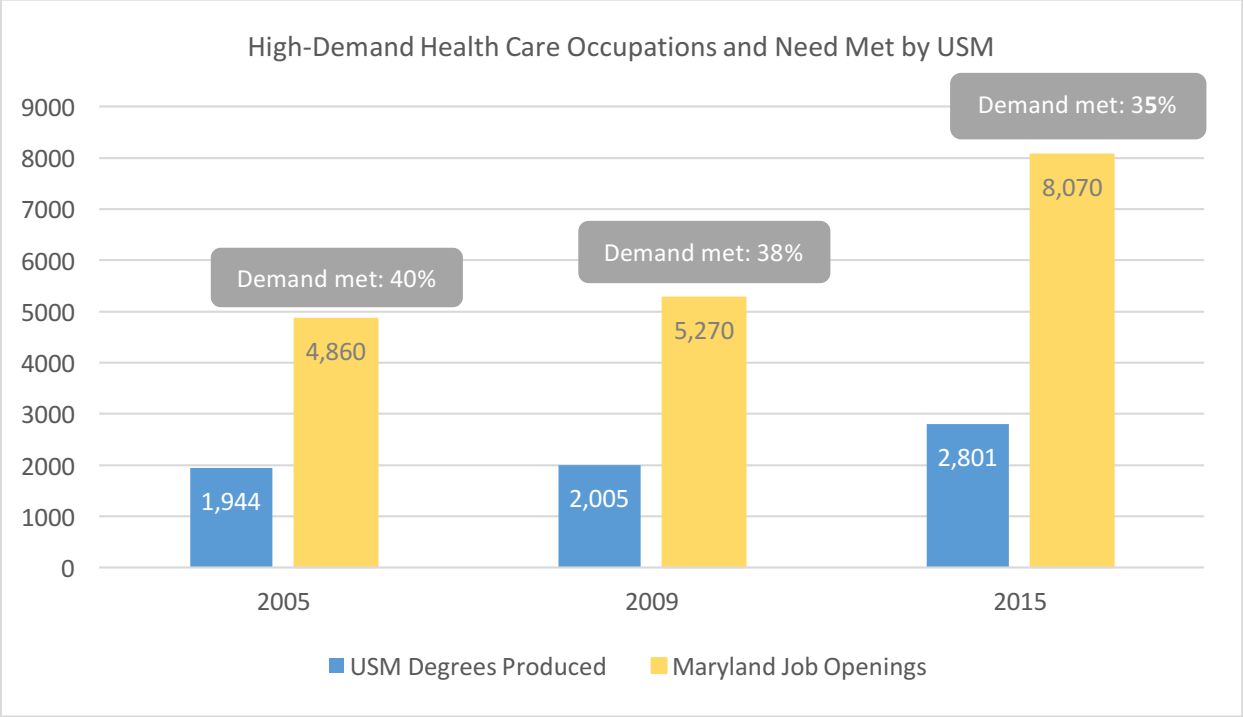
[vii] The University of Maryland, College Park offers a pre-nursing program, articulated with UMB, but does not offer students a nursing degree.
[viii] USM does not offer programs in podiatry or chiropracty, despite existing demand.

In 2016, USM awarded more than 3,400 degrees and postgraduate certificates in the health professions. Degree and certificate production is up 75 percent over 2005, when the total stood below 2,000 credentials. Overall, degree distribution closely mirrors enrollment distribution. For example, nurses account for 42 percent of total USM health professions enrollment and 42 percent of all USM credentials awarded in 2015–16. See Table W–2 for the number of degrees and certificates awarded by USM institutions.

IS USM MEETING STATE WORKFORCE DEMAND?

Despite the dramatic growth in degree production within USM, the growth in workforce demand—i.e., annual job openings—has kept pace with or exceeded the System's production increases. In 2005, when USM conducted its first study of workforce demand, USM graduates met approximately 40 percent of the total demand in key health care professions. In 2015—despite a 10-year, 44 percent increase in the number of degrees conferred in the highest demand fields—USM graduates represented only 35 percent of the job openings in those fields (Figure W–2). These figures are based on 2014–15 production and may have improved marginally with additional degree growth, but the overall picture remains unchanged: The rapid growth of Maryland's health care sector is straining the ability of our USM universities to meet demand.

Figure W–2. Job Openings in Health Professions That Rank Among Maryland's Top 100 Occupations, and USM Degrees Produced in Those Professions



Maryland's non-USM universities do contribute substantially to the total number of graduates moving into the state's workforce, but it remains that USM prepares a full two-thirds of those receiving degrees in the health professions (at the bachelor's degree level and above). Additionally, there are significant areas of demand for which USM institutions are Maryland's only source of graduates, including such critical areas as dentistry, physical therapy, and physician assistant. Maryland's health care production strength lies very much with USM.

With these overall trends in mind, it is important to note that the distribution of demand within the health care professions is not uniform, nor is the production. While Maryland's health care workforce demand overall is not met by the graduates produced in-state, there are occupations where demand is met or nearly met, and there are, too, a few areas where degrees are actually overproduced as compared to jobs available. See Table W–3 for a breakdown of health occupation demand and associated degree production by USM and non-USM institutions.

Finally, nursing merits particular attention because of the sheer scale of the nursing need in Maryland and because nursing brings with it some complicating factors, discussed in the next chapter. For instance, there is now significant pressure on registered nurses to be educated at the bachelor's degree level or higher. Nonetheless, many RN positions statewide are filled by nurses holding only an associate degree. In 2014–15, Maryland's community colleges awarded more than 1,600 associate degrees in nursing, skewing the outlook for the state's nursing supply and demand. That is, while total nurse production may ultimately come close to the number of jobs available in Maryland, the supply could be at a level of training considered below optimal. This offers USM an ongoing challenge—moving substantial numbers of nurses from the associate degree to the bachelor's.

Additionally, 14 Maryland institutions award nursing degrees at the bachelor's level or above. Most of these programs are substantial, awarding dozens of degrees every year (Table W–4), and each independently pursues arrangements to offer coursework and clinical placements, which entails securing appropriate facilities and health care partners to do so. While the result is likely to be inefficient, of greater concern is the competition for resources that this engenders among institutions.

DEMAND FOR HEALTH CARE WORKERS CONTINUES TO OUTPACE PRODUCTION

The overall picture that these data form is one of strong workforce production in the face of accelerating demand. USM, and other Maryland institutions, have been responsive to the state's growing health care workforce needs, increasing degree production, expanding online delivery options, and establishing cross-institutional agreements to increase training capacity.

But these efforts have thus far fallen short. This may be, in part, because the per capita demand for the health care workforce in Maryland is substantially higher than in competitor states, suggesting that Maryland might have to tailor its approaches to the state's unique—and dramatic—demand profile.

Table W–1. Enrollment in Health Professions Programs, by USM Institution and Student Level: Fall 2016

Institution	Program	Undergrad	Grad/First Professional	Total
Bowie				
	Nursing	530	88	618
Coppin				
	Health Information Management	89	0	89
	Nursing	713	45	758
Frostburg				
	Health Science	50	0	50
	Nursing	457	23	480
Salisbury				
	Nursing	538	29	567
	Medical Laboratory Tech.	64	0	64
	Respiratory Therapy	108	0	108
Towson				
	Health Professions, General			
	Health Science	351	75	426
	Clinician to Admin Transition	0	1	1
	Allied Health (BTPS)	94	0	94
	Health Care Management	321	0	321
	Nursing	1,197	57	1,254
	Occupational Therapy			
	Occupational Therapy	116	153	269
	Occupational Science	0	12	12
	Occupation & Well-Being	160	0	160
	Hearing & Speech Sciences			
	Speech Language Pathology	157	142	299
	Deaf Studies	170	0	170
	Audiology	100	0	100
	Health Professions Specialties			
	Autism Studies	0	44	44
	Physician Assistant Studies	0	63	63
UB				
	Health Systems Management	195	146	341
UMB				
	Nursing	777	951	1,728
	Dentistry			
	Dentistry	0	523	523
	Oral Pathology	0	4	4
	Post Graduate Dentistry	0	62	62
	Dental Hygiene	43	0	43
	Medicine	0	651	651
	Preventative Medicine			
	Clinical Research	0	19	19
	Epidemiology	0	46	46

Institution	Program	Undergrad	Grad/First Professional	Total
	Pharmacy			
	Pharmacy	0	629	629
	Pharma. Health Services Research	0	28	28
	Pharmaceutical Sciences	0	57	57
	Regulatory Science	0	86	86
	Pharmacometrics	0	42	42
	Physical Therapy			
	Physical Rehabilitation Science	0	7	7
	Physical Therapy	0	175	175
	Public Health	0	42	42
	Medical Laboratory Tech.	46	7	53
	Health Professions Specialties			
	Health Science	0	75	75
UMBC				
	Health Professions, General	245	0	245
	Health Professions Specialties	96	30	126
UMCP				
	Health Administration			
	Health Administration	0	17	17
	Health Services	0	16	16
	Pre-Nursing *(with UMB)*	48	0	48
	Public Health			
	Public Health	0	150	150
	Public Health Science	443	0	443
	Global Health	0	3	3
	Maternal and Child Health	0	9	9
	Hearing & Speech Sciences			
	Hearing & Speech Sciences	201	70	271
	Clinical Audiology	0	31	31
	Veterinary Specialties			
	Combined—Veterinary Science	32	0	32
	Doctor of Veterinary Medicine	0	119	119
	Veterinary Medical Science	0	16	16
UMES				
	Physician Assistant	0	101	101
	Physical Therapy			
	Physical Therapy	0	88	88
	Rehabilitation Services	154	0	154
	Pharmacy			
	Pharmacy	0	188	188
	Pharmaceutical Sciences	0	4	4
UMUC				
	Health Services	848	0	848
	Nursing	239	0	239

Table W–2. USM Degrees in Health Care Profession, by Level: FY 2016

		Degree Level			
Area	Program	Undergraduate	Graduate	Certificate	Total
Health Prof, General	Health Science	167	24	3	194
	Health Information Mgmt.	17	0	8	25
	Allied Health (BTPS)	24	0	0	24
Health Care Mgmt.	Health Care Management	210	7	2	219
	Health Services	0	1	0	1
Nursing	Nursing	1,075	346	36	1,457
Dentistry	Dentistry	0	124	0	124
	Oral Pathology–Dental Program	0	1	0	1
	Post Graduate Dentistry	0	0	23	23
Medicine	Medicine	0	159	0	159
Preventative Medicine	Epidemiology & Preventive Med.	0	10	3	13
	Epidemiology & Human Genetics	0	7	0	7
Occupational Therapy	Occupational Therapy	38	86	0	124
Pharmacy	Pharmacy	0	205	0	205
	Pharma. Health Services Research	0	18	0	18
	Pharmaceutical Sciences	0	5	0	5
	Regulatory Science	0	52	0	52
	Pharmacometrics	0	13	0	13
Physical Therapy	Physical Therapy	0	84	0	84
Dental Hygiene	Dental Hygiene	22	0	0	22
Public Health	Public Health	59	56	4	119
	Global Health	0	0	3	3
	Maternal & Child Health	0	3	0	3
Hearing/Speech Sciences	Speech-Language Path. & Aud.	122	76	0	198
	Deaf Studies	43	0	18	61
	Clinical Audiology	0	7	0	7
Medical Lab Technology	Medical Lab Science	28	3	0	31
Health Prof. Specialties	Autism Studies	0	0	39	39
	Emergency Health Services	17	19	0	36
	Respiratory Therapy	36	0	0	36
	Rehabilitation Services	41	0	0	41
	Physician Assistant	0	33	0	33
	Physician Assistant Studies	0	36	0	36
	Doctor of Veterinary Medicine	0	29	0	29

Table W–3. Health Care Workforce Demand and Degree Production, Top 200 Occupations

Demand Rank	Occupational Title	MD Yearly Openings*	USM Degrees	Need Met by USM	All Other MD Degrees	Need Met Statewide
1	Registered Nurses	3,450	**1,421**	41%	784	64%
15	Physicians and Surgeons, All	625	**153**	24%	113	43%
16	Medical and Health Services Managers	620	**292**	47%	172	75%
24	Pharmacists	435	**168**	39%	60	52%
38	Dentists, General	330	**127**	38%	0	38%
41	Physical Therapists	315	**48**	15%	0	15%
51	Medical and Public Health Social Workers	260	**164**	63%	61	86%
52	Medical and Clinical Laboratory Technologists	260	**31**	12%	5	14%
66	Dental Hygienists	225	**44**	20%	0	20%
71	Occupational Therapists	205	**65**	32%	0	32%
74	Rehabilitation Therapists	190	**29**	15%	0	15%
75	Speech-Language Pathologists	190	**79**	42%	95	92%
81	Physician Assistants	175	**26**	15%	0	15%
82	Mental Health and Substance Abuse Social Workers	170	**107**	63%	39	86%
83	Health Educators	170	**14**	8%	112	74%
85	Mental Health Counselors	165	**10**	6%	42	32%
87	Respiratory Therapists	165	**23**	14%	0	14%
100	Dietitians and Nutritionists	120	**0**	0%	0	0%
104	Social and Community Service Managers	100	**213**	213%		213%
108	Veterinarians	100	**22**	22%	0	22%
114	Occupational Health and Safety Specialists	85	**115**	135%		135%
127	Optometrists	60	**0**	0%	0	0%
145	Recreational Therapists	40	**10**	25%	0	25%
149	Athletic Trainers	35	**26**	74%	0	74%
158	Chiropractors	30	**0**	0%	0	0%
159	Podiatrists	30	**0**	0%	0	0%
182	Radiation Therapists	15	**0**	0%	5	33%
183	Audiologists	15	**0**	0%	7	47%
	Health Care	**8,630**	**3,094**	**36%**	**1,495**	**53%**

* Estimated openings per year through 2023

Indicates current overproduction in field

Table W–4. Nursing Degrees Awarded by Maryland Institutions: FY 2013–FY 2017

Institution	2013	2014	2015	2016	2017
BACHELOR'S					
Bowie State University	69	84	86	112	50
Coppin State University	101	136	85	85	68
Frostburg State University	16	51	97	139	155
Salisbury University	93	86	94	90	97
Towson University	184	186	200	242	273
UMB	275	287	292	364	378
UMUC	0	0	7	44	97
Hood College	0	22	9	5	5
Johns Hopkins University	234	278	282	287	125
Morgan State University	82	61	28	18	7
Notre Dame of Maryland University	167	143	161	213	208
Sojourner-Douglass College	65	68	83	0	0
Stevenson University	191	181	175	215	189
Washington Adventist University	138	82	37	1	14
MASTER'S					
Bowie State University	28	53	46	42	30
Coppin State University	13	8	18	9	11
Frostburg State University	0	0	0	0	12
Salisbury University	17	6	6	3	1
Towson University	26	28	24	20	18
UMB	308	286	334	243	176
Johns Hopkins University	83	86	96	93	225
Morgan State University	46	24	9	6	5
Notre Dame of Maryland University	38	66	40	55	47
Stevenson University	36	45	49	45	62
Washington Adventist University	24	26	7	10	3
DOCTORATE					
Coppin State University	0	0	0	0	2
Salisbury University	0	0	8	0	1
UMB	31	17	40	29	60
Johns Hopkins University	25	18	23	26	22

NURSING ARTICULATION AND COLLABORATION

An urgency for more—and more highly educated—nurses obligates us to explore ways to increase nursing enrollment at all degree levels, to grow our faculty corps, and to investigate better articulation among programs and greater collaboration among institutions.

MEMBERS

Jane Kirschling (chair)	Dean *University of Maryland School of Nursing*
Timothy Chandler	Provost *Towson University*
Monique Davis	Associate Dean and Director, Department of Nursing *Montgomery College*
Christy Dryer	Vice President of Academic Programs *Cecil College*
Heather Gable	Chair, Department of Nursing *Frostburg State University*
Hayley Mark	Chair, Department of Nursing *Towson University*
Danita Tolson	Chair, Baccalaureate Nursing Education *Coppin State University*
Jeff Willey	Chair, Department of Nursing *Salisbury University*
Claudine Williams	Associate Director, Policy Analysis *Maryland Health Services Cost Review Commission*

It has already been established that, in the near term, nursing faces acute and potentially crippling shortages in Maryland—shortages that seem especially pervasive given the sheer number of nurses in the workforce, which is dramatically more than any other health professional. For this reason, it is unsurprising that many sufficiency-related challenges in health care education—e.g., assuring a robust teaching faculty; securing adequate academic and simulation facilities; ensuring all students have access to high-quality clinical rotations—disproportionately affect nursing.

The purpose of this chapter is twofold. First, it provides an overview of the state of nursing today, including brief descriptions of the *nursing workforce* in the U.S. and in Maryland; the current state of nursing education in Maryland; *external forces* influencing nursing education, both nationally and locally; and Maryland's nursing education initiatives. Second, it provides recommendations to assure that Maryland has a well-educated nursing workforce in the years to come.

These recommendations are based, in part, on the results of a survey distributed to university provosts or their designees. The survey, completed by all seven USM institutions with a nursing program, is provided in Appendix N–A. Our recommendations follow:

1. Grow enrollment in entry-level and graduate nursing programs
2. Ensure adequacy of clinical placement sites
3. Ensure a sufficient and stable clinical faculty corps
4. Improve NCLEX-RN pass rates.

THE NURSING WORKFORCE IN THE U.S. AND MARYLAND

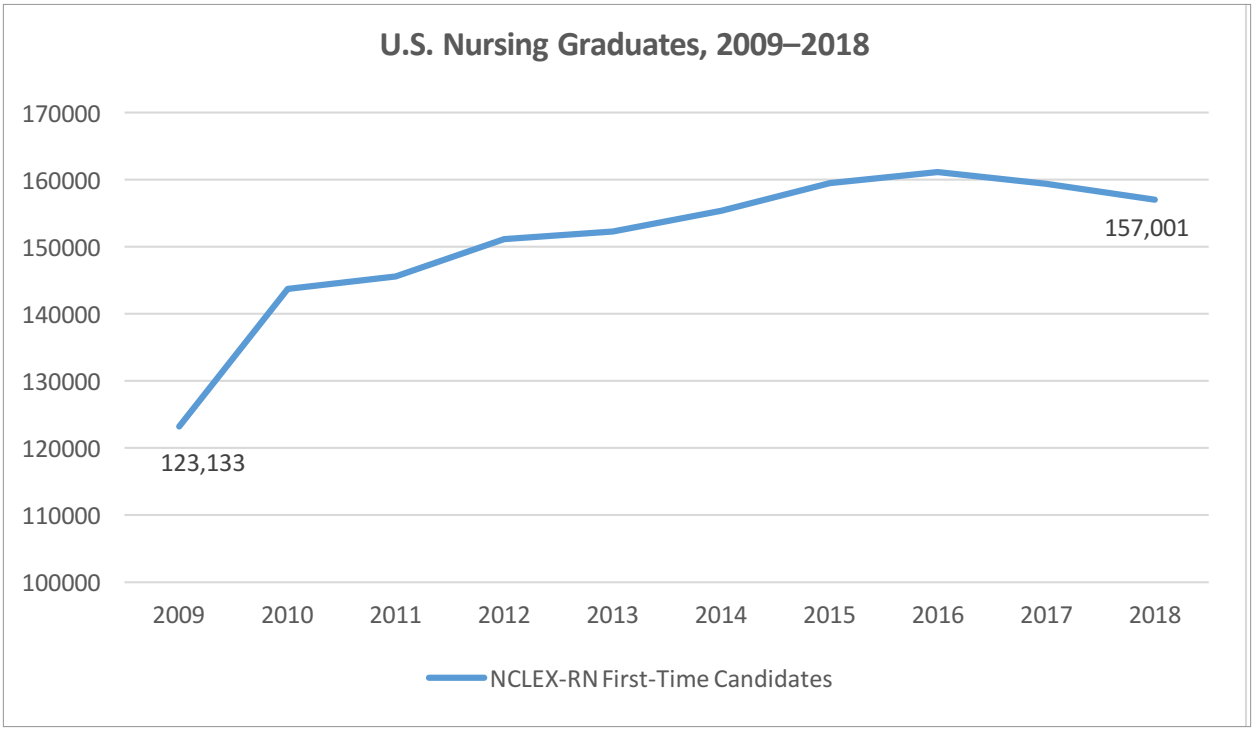
The nursing profession comprises the largest number of health care providers in the United States, with 2.7 million RNs employed;[9] there are 79,325 RNs with active-status licenses in Maryland.[10]

One of the challenges affecting the delivery of health care is shortages of providers. Post-World War II, nursing workforce shortages have occurred cyclically. The early shortages were either driven by supply (not having enough nurses) or demand (growth in RN positions). However, in recent years the shortages have been the result of supply and demand, requiring health care organizations to place greater emphasis on retention of RNs—including offering residency programs for new graduates to better facilitate the transition to practice—and for nursing education to expand the number of nursing students. Nursing education programs have responded to the need for additional RNs. Figure N–1 provides a national snapshot of the growth of RN program graduates.

According to the Bureau of Labor Statistics (BLS) Employment Projections: 2012–2022 (released in December 2013), registered nursing is among the top occupations in terms of job growth through 2022. The RN workforce is expected to grow from 2.71 million in 2012 to 3.24 million in 2022, an increase of 526,800 RNs or 19 percent. BLS also projects the need for 525,000 replacement nurses in the workforce, bringing the total number of job openings for nurses due to growth and replacements to 1.05 million by 2022.[11]

According to a 2016 U.S. Department of Health and Human Services (DHHS) report, Maryland is one of four states that will experience a shortage of 10,000 or more RNs in 2025,[ix] with a projected shortfall of 12,100 RNs.[12]

Figure N–1. HRSA Compilation of Data From the National Council of State Boards of Nursing, Exam Statistics and Publications: 2009–2018



However, in July 2017, DHHS projected a coming surplus of RNs in Maryland. DHHS puts Maryland's projected supply of RNs at 86,000 in 2030 (up from 58,700 in 2017) and the demand at 73,900, resulting in a surplus of 12,100 FTEs, or 16.4 percent. Overall, the report projects a national registered nurse excess of about 8 percent in 2030.[13]

In November 2016, DHHS issued a report projecting that the primary care Nurse Practitioner (NP) supply will also outpace demand at the national level. Assuming continuation of current training levels and workforce participation patterns, the report projected the *supply* of NPs to grow from 57,330 to 110,540 FTEs in 2025—a 93 percent increase, while the national *demand* was projected to grow to only 68,040 FTEs—a 19 percent increase (p. 5).[14]

In fact, Maryland is in the U.S. Census Bureau's South region, which is projected to have the greatest oversupply of primary care NPs in 2025—18,070. However, this same region is projected to have the nation's largest deficit of primary care physicians—about 13,860 FTEs—needed to meet 2025 demand. "With delivery system changes and full utilization of NP and [Physician Assistant] services," the report concludes, "the projected [nationwide primary care physician] shortage of 23,640 FTEs can be effectively mitigated."[15]

[ix] The other states are Arizona with 28,100; North Carolina with 12,900; and Colorado with 12,900.

The Bureau of Labor Statistics projects that overall employment of Nurse Anesthetists will grow by 16 percent (from 41,800 to 48,500) between 2016 and 2026; Nurse Midwives by 21 percent (from 6,500 to 7,800); and NPs by 36 percent (from 155,500 to 211,500). Across all three advanced practice roles, this is an average increase of 31 percent, and this growth is much higher than the average for all occupations.[16]

NURSING EDUCATION IN MARYLAND

Maryland is fortunate to have a number of options for persons interested in pursuing a career as an RN. USM has five universities that offer entry-level baccalaureate degrees in nursing (BS/BSN): Bowie State University, Coppin State University, Salisbury University, Towson University, and the University of Maryland School of Nursing.[x] Additionally, five non-USM universities in Maryland offer the entry-level BSN: Hood College, Morgan State University, Notre Dame of Maryland University, Stevenson University, and Washington Adventist University.

All of the BS/BSN programs are offered by four-year degree granting institutions, with the exception of the University of Maryland School of Nursing, which is an upper-division program. Coppin State University and Salisbury University offer an accelerated BSN program for persons who have a baccalaureate degree in another discipline, and there are two master's entry-level nursing programs in Maryland for persons who have a baccalaureate degree in another discipline (John Hopkins University School of Nursing and the University of Maryland School of Nursing). In addition, there are 15 associate degree programs in nursing (ADN). Graduates of ADN, BS/BSN, and master's entry programs sit for the NCLEX-RN exam upon graduation in order to be licensed as a registered nurse.

Maryland's public and private universities offer an array of degree options for RNs with associate degrees to continue their education. These nurses have the option of pursuing their baccalaureate degree (RN-to-BSN) or their master's degree (RN-to-MS/MSN[xi]). Increasingly these programs are offered in an online or hybrid format to accommodate the needs of adult learners, many of whom are working and juggling other responsibilities. In addition to the USM universities that offer the entry-level BS/BSN, two additional USM institutions offer only the RN-to-BSN option (Frostburg University and University of Maryland University College).

In an effort to increase the number of nurses with baccalaureate degrees, five of Maryland's public and private universities have recently partnered with community colleges to implement associate-to-baccalaureate (ATB) programs (Table N–1). Students in these programs apply for admission into an ADN program at a community college simultaneously with an application for admission into a BS/BSN program at a university. Students begin their nursing program at the community college, but complete the BS/BSN requirements at the university and graduate with both an ADN and a BS/BSN.

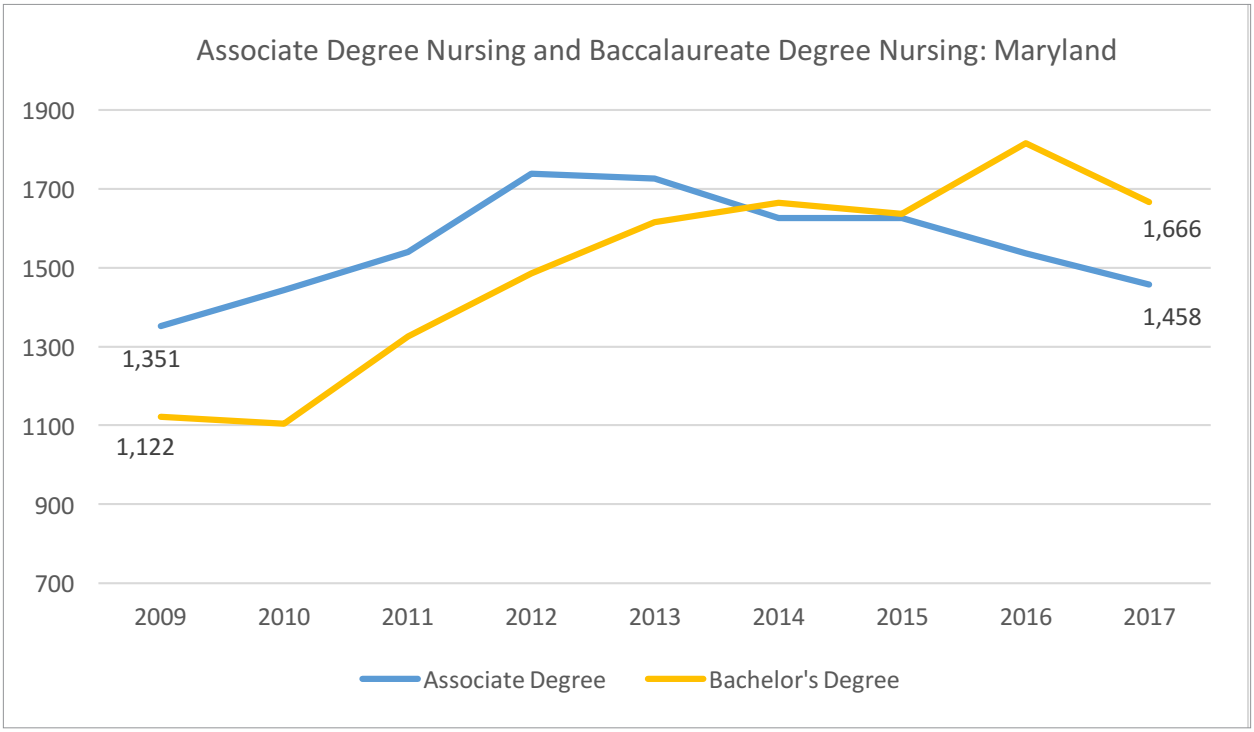
[x] Towson and Salisbury universities award a BS to nursing graduates; others award the BSN.
[xi] Salisbury University and the University of Maryland School of Nursing award an MS to nursing graduate; others award the MSN.

Table N–1. Associate-to-Baccalaureate (ATB) Programs in Maryland[xii]

Maryland Universities	Agreements With Maryland Associate Degree Program(s)
Frostburg State University	Allegany College of Maryland, Anne Arundel Community College, Carroll Community College, Cecil College, College of Southern Maryland, Community College of Baltimore County, Frederick Community College, Hagerstown Community College, Harford Community College, and Prince George's Community College
Notre Dame of Maryland University	Community College of Baltimore County
Stevenson University	Anne Arundel Community College, Carroll Community College, College of Southern Maryland, Community College of Baltimore County, and Howard Community College
Towson University	Carroll Community College, Cecil College, Community College of Baltimore County, Frederick Community College, Harford Community College, and Hagerstown Community College
UMB–University of Maryland School of Nursing (UMSON)	Anne Arundel Community College, Baltimore Community College, Carroll Community College, Cecil College, Chesapeake College, College of Southern Maryland, Frederick Community College, Harford Community College, Howard Community College, Montgomery Community College, and Prince George's Community College

Appendix N–B shows the type and location of current entry-level BS/BSN and ADN programs in Maryland. Figure N–2 summarizes the number of ADN and BS/BSN degrees awarded by Maryland nursing programs over the past five years. It is important to note that in 2014 the number of BS/BSN degrees first exceeded the number of ADN degrees.

Figure N–2. ADN and BS/BSN Degrees Awarded in Maryland: 2009–2017



Source: Maryland Higher Education Commission, Degree Trends
Notes: 1. Johns Hopkins University has closed its second-degree BSN and is admitting second-degree master's. **2.** Bachelor's numbers include RN-to-BSN and ATB. **3.** Not all graduates work in Maryland. See NCLEX-RN first-time takers (number who successfully completed).

[xii] Additional ATB agreements are in process.

Given that not all graduates of Maryland's nursing programs stay in Maryland to work and that graduates from nursing programs in other states come to Maryland to practice, NCLEX-RN results for first-time takers in Maryland may better reflect the number of new nurses in Maryland than the number of degrees awarded.

Table N–2 provides the NCLEX-RN first-time candidate information for Maryland from FY 2012 through FY 2018. It is important to note that in this six-year period—despite overall growth nationally through 2016 in the number of candidates—the total number of candidates in Maryland declined from a high of 3,026 (FY 2013) to a low of 2,350 (FY 2018). Candidates from Maryland's BS/BSN and master's entry programs have ranged from a high of 1,317 in FY 2014 to a low of 1,034 in FY 2018. Part of this decline may be the result of the Johns Hopkins University School of Nursing transitioning from a BSN program for persons who hold a baccalaureate degree in another discipline to a master's entry program. Maryland's ADN programs have ranged from a high of 1,764 in FY 2013 to a low of 1,316 in FY 2018.

When NCLEX-RN candidates fail the exam on their first attempt, they have the option of retaking the exam. USM individual nursing program results for first-time test takers are provided in Table N–8 (p. 34).

Table N–2. FY 2012–FY 2018 All NCLEX-RN First-Time Candidates: Maryland BS/BSN and Master's Entry Programs, Maryland ADN Programs, All Maryland Nursing Programs, and United States

	Maryland BS/BSN and Master's Entry Programs	Maryland ADN Programs	All Maryland Programs	U.S. Total
	# Tested / # Passed	# Tested / # Passed	# Tested / # Passed	# Tested / # Passed
FY 2012	1,265 / 1,083	1,648 / 1,472	2,913 / 2,555	151,135 / 134,394
FY 2013	1,262 / 1,038	1,764 / 1,560	3,026 / 2,598	152,243 / 132,504
FY 2014	1,317 / 1,038	1,635 / 1,342	2,952 / 2,380	155,335 / 128,243
FY 2015	1,277 / 994	1,658 / 1,355	2,935 / 2,349	159,528 / 131,666
FY 2016	1,202 / 994	1,557 / 1,291	2,759 / 2,285	161,156 / 135,276
FY 2017	1,124 / 956	1,457 / 1,252	2,581 / 2,208	159,419 / 137,440
FY 2018	1,034 / 916	1,316 / 1,145	2,350 / 2,061	157,001 / 137,865

Maryland has an array of options for BS/BSN-prepared RNs to return to graduate school to further their education. The master's degree and doctor of nursing practice (DNP) degree focus on specialization. The PhD degree prepares nurse scientists. Appendix N–C provides a comprehensive list of Maryland's nursing programs, including all degrees offered.

EXTERNAL FORCES IMPACTING NURSING EDUCATION

While a greater emphasis is being placed on our country's need for a well-educated nursing workforce, a number of external forces are impacting nursing. In 2010, the Institute of Medicine released *The Future of Nursing: Leading Change, Advancing Health*, which laid out a series of recommendations. A particularly salient recommendation is to "increase the proportion of nurses with a baccalaureate degree to 80 percent by 2020."[17] In 2015, *Assessing Progress on the Institute of Medicine Report THE FUTURE OF NURSING* was released, indicating that "the percentage of baccalaureate-educated nurses rose from 49 percent in 2010 to 51 percent in 2014" (p. 62). The report also noted that "Between 2002 and 2012, more growth was observed among four-year college programs (from 882 in 2002 to 1,413 in 2012, a 60 percent increase) than among two-year college programs (from 729 to 857, an 18 percent increase)" (p. 63).[18]

Health care employers are modifying their hiring practices. In 2011, as reported by the American Association of Colleges of Nursing, 30 percent of hospitals and other health care settings required that RNs hold a baccalaureate degree at the time of hire; this share increased to 49 percent in 2017. Additionally, 77 percent of employers surveyed in 2011 *gave strong preference* to hiring baccalaureate-prepared nurses; in 2017, this share increased to 86 percent.[19]

The growth in requiring, or giving strong preference to, baccalaureate-prepared nurses is associated with the significant body of research that links better patient outcomes in hospital settings (e.g., lower mortality, lower failure-to-rescue rates) with having a greater percentage of baccalaureate-prepared RNs. In addition, a number of hospitals are working to achieve American Nurses Credentialing Center (ANCC) Magnet® recognition. In 2013, ANCC began requiring that Magnet® applicants have a plan to ensure that 80 percent of their nursing workforce is baccalaureate-educated by 2020. There are currently 477 Magnet® facilities in the U.S., including six hospitals in Maryland: Anne Arundel Medical Center (first recognized in 2014), MedStar Franklin Square Medical Center (2008), Mercy Medical Center (2011), the Johns Hopkins Hospital (2003), the University of Maryland Medical Center (2009), and University of Maryland Shore Regional Health (2009).

Additional external factors impacting the delivery of nursing education include faculty shortages and clinical sites that increasingly limit the number of students in a clinical group due to the acuity of the patient population and/or the move to single-patient rooms (which limits the number of patients on a hospital unit). Nursing programs have incurred additional faculty costs associated with the reduced clinical group size. There is also greater competition for clinical sites, especially in specialty areas such as obstetrics, pediatrics, and psychiatric/mental health nursing. In addition, nursing programs are increasing their use of simulation to enhance clinical learning with well-developed case scenarios. This shift in pedagogy requires faculty development and access to simulation labs and, in some scenarios, the use of standardized patients to enhance the learning environment.

The American Association of Colleges of Nursing (AACN) reports that "U.S. nursing schools turned away 69,188 qualified applicants from baccalaureate and graduate nursing programs in 2017 due to an insufficient number of faculty, clinical sites, classroom space, clinical preceptors, and budget constraints. Almost two-thirds of the nursing programs responding to the survey pointed to faculty shortages as a reason for not accepting all qualified applications into baccalaureate programs."[20]

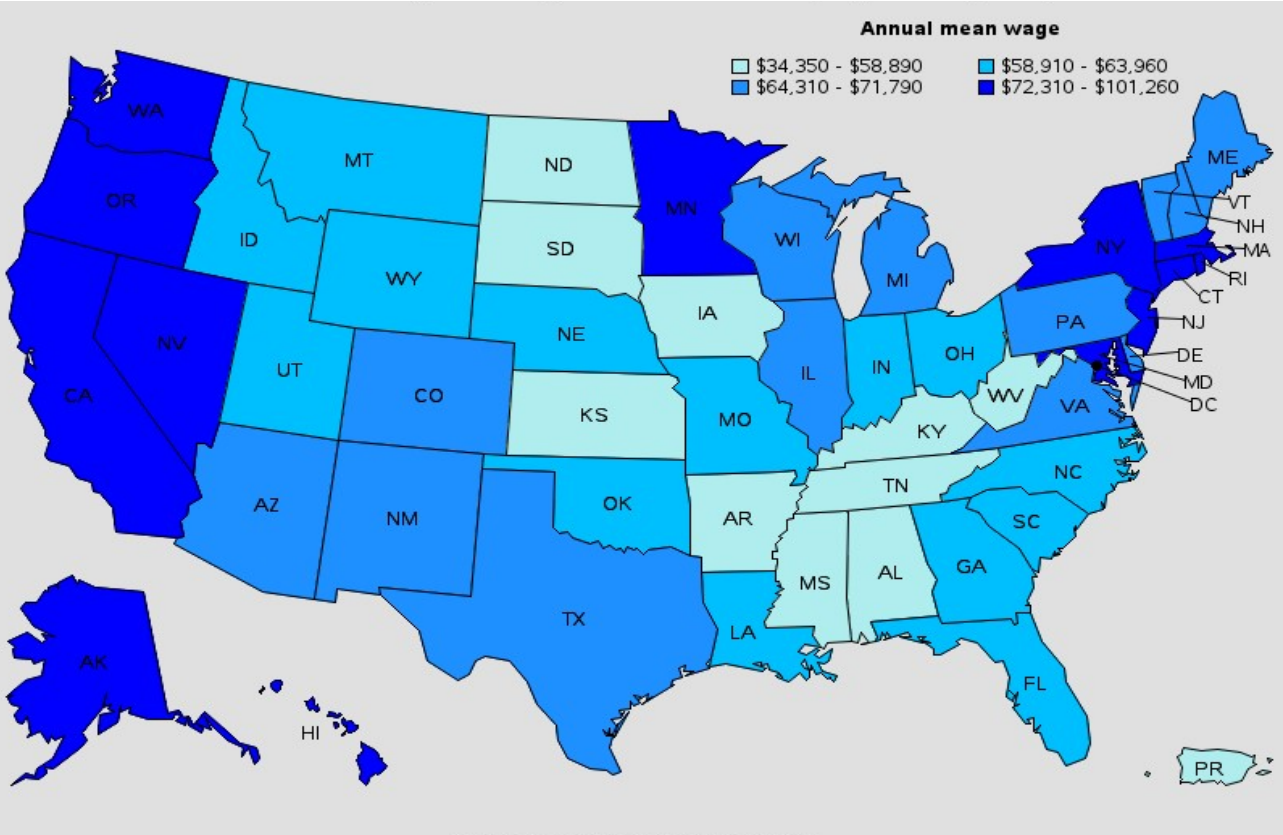
Faculty who teach in baccalaureate and graduate programs are expected to hold a master's degree in nursing, and increasingly a doctoral degree is expected given the academic demands of the professoriate. In addition, nursing faculty are expected to have specialty expertise (e.g., pediatrics, community/public health, adult health, mental health). In 2016, 12 Maryland nursing programs at the baccalaureate level and higher reported 32 full-time faculty vacancies to AACN.

Faculty salaries are often not competitive with those in the clinical setting. According to the U.S. Department of Labor, in May 2015, Maryland's RNs had an annual mean wage in the range of $72,310 to $101,260, as shown in Figure N–3. The annual mean wage of Maryland nurse practitioners, who hold a graduate degree, fell within the $104,540 to $120,930 range.[21] In contrast, AACN reported that nursing faculty across all ranks (professor, associate professor, assistant professor, and instructor) teaching in Maryland's baccalaureate programs and higher earned $106,302, on average, for 12-month faculty positions in 2015.[xiii]

[xiii] AACN data include Coppin State University, Frostburg University, Hood College, Johns Hopkins University, Morgan State University, Notre Dame of Maryland University, Salisbury University, Stevenson University, Towson University, Uniformed Services University of the Health Sciences, the University of Maryland School of Nursing, and Washington Adventist University.

On average, 12-month doctorally prepared assistant professors earned $102,778; non-doctorally prepared assistant professors earned $88,490; doctorally prepared instructors earned $97,231; and non-doctorally prepared instructors earned $89,280. As one would expect, faculty with academic- year appointments (9 or 10 months) earned less. The average faculty salary, irrespective of rank, was $86,974. Appendix N–D provides faculty salary information for Maryland's baccalaureate and higher degree nursing programs, as well as for the Northeast Region and the U.S.

Figure N–3. Annual Mean Wage of Registered Nurses, by State: May 2015



Source: U.S. Department of Labor, Bureau of Labor Statistics, *https://www.bls.gov/oes/current/oes291141.htm*

A final external force meriting acknowledgment is that selected health care entities are opting to charge for clinical placements. While some for-profit nursing programs may have the financial resources to accommodate this request, this is not the case for USM nursing programs.

NURSING EDUCATION INITIATIVES IN MARYLAND

In 2005, Maryland's Health Services Cost Review Commission approved an increase of 0.1 percent of regulated patient revenue "for the use in expanding the pool of nurses in the State by increasing the capacity of nursing programs in Maryland." Administered by the Maryland Higher Education Commission, the Nurse Support Program II (NSPII) is a competitive grant application process that provides non-recurring funds to successful applicants. NSPII funding is focused on four of the Future of Nursing recommendations: 1) Increase

the proportion of nurses with a baccalaureate degree to 80 percent by 2020; 2) Double the number of nurses with a doctorate by 2020; 3) Ensure that nurses engage in lifelong learning; 4) Build an infrastructure for the collection and analysis of interprofessional health care workforce data.[xiv]

With NSPII funding, investments have been made to support academic progression from the ADN to the BS/BSN, to build a cadre of qualified nursing faculty, to support nursing schools as they build their expertise in the use of simulation (including acquiring the necessary equipment), and to foster nursing student success. Appendix N–E lists the 2017 awarded grants.

In June 2016, the Maryland Action Coalition Summit showcased a number of NSPII-funded projects, including the following projects led by USM nursing programs:

- Advancing Education Transformation: Toolkits and Simulation Using Standardized Patients to Teach Essential Psychiatric Mental Health Nursing Skills (*Salisbury University*)
- Associate to Bachelor's (ATB): Positioning More Baccalaureate Nurses at the Bedside (*Frostburg University*)
- Degree Completion Initiative: Expanding and Improving Opportunities for Baccalaureate Education in Nursing for Maryland Nurses (*Towson University*)
- Development of an Open-Access Resource to Support Nurse Educators (*University of Maryland School of Nursing*)
- Eastern Shore Faculty Academy and Mentorship Initiative: A Hybrid Experience to Develop Expert Clinicians as Clinical Faculty (*Salisbury University*)
- Eastern Shore–Western Shore Faculty Initiative: Creating a Needs Assessment (*Salisbury University*)
- Expediting Doctoral Education on the Eastern Shore: Initiatives to Expand Maryland's Capacity for Preparing Nursing Faculty (*Salisbury University*)
- Faculty Mentorship: Implementation at the University of Maryland School of Nursing (*University of Maryland School of Nursing*)
- From Conversations to Curriculum: Listening to the Advisory Board (*University of Maryland School of Nursing*).[22] [xv]

Maryland has also benefited from national funding from the Robert Wood Johnson Foundation available to state Action Coalitions to implement the *Future of Nursing* recommendations. In 2013, the University of Maryland School of Nursing and Montgomery College received funding to build on Maryland's RN-to-BSN articulation model and move to models that offer seamless and timely academic progression.[xvi] In 2015, a second grant was awarded to support Maryland's associate and baccalaureate degree programs working together to review the Maryland RN-to-BSN articulation agreement and to revise and refine the document to reflect the work currently occurring around academic progression. In addition, the grant supported work on developing a Diversity and Inclusivity Plan for the Maryland Action Coalition.[xvii]

[xiv] About the Nurse Support Program II, *https://nursesupport.org/nurse-support-program-ii/about-nsp-ii/*
[xv] Additional reports on USM NSPII-funded projects were presented at the 2017 and 2018 Maryland Action Coalition Summits. For 2017, see *http://www.nursing.umaryland.edu/academics/pe/events/mdac/mdac-2017/.* For 2018, see *http://www.nursing.umaryland.edu/academics/pe/events/mdac/.*
[xvi] To learn more about the 2013 grant, visit *https://www.nursing.umaryland.edu/news-events/news/news-story-new-3-million-initiative-from-robert-.php*
[xvii] To learn more about the 2015 grant, visit *https://www.nursing.umaryland.edu/news-events/news/awarded-program-grant.php*

Initiatives focused on academic progression are key to having a well-educated nursing workforce. This strategy was affirmed in a joint statement signed by the American Association of Community Colleges, the Association of Community Colleges Trustees, the American Association of Colleges of Nursing, the National League for Nursing, and the National Organization for Associate Degree Nursing: "To fulfill our shared goal to prepare a robust nursing workforce, the undersigned organizations acknowledge our full support of academic progression for nursing students and graduates. Community college presidents, boards, and program administrators are aligned with the nation's nursing association leaders in the belief that every nursing student and nurse deserves the opportunity to pursue academic career growth and development. It is through the collaboration and partnering of our various organizations that we can facilitate and inspire the seamless academic progression of nursing students and nurses. Our common goal is a well-educated, diverse nursing workforce to advance the nation's health."[23]

RECOMMENDATIONS

Given that Maryland is forecasted to experience a shortage of RNs and given the emphasis being placed on employing a greater number of baccalaureate-prepared nurses, it is critical that senior leadership in higher education advocate for, and bring voice to, the issues faced by Maryland's nursing programs.

We offer the following recommendations, focused on growing enrollment, expanding clinical site availability, enlarging Maryland's nursing faculty corps, and improving pass rates on the NCLEX-RN licensure exam.

GROW ENROLLMENT IN ENTRY-LEVEL AND GRADUATE NURSING PROGRAMS

The need for more, and more highly educated, nurses in Maryland requires that we grow our nursing programs at the baccalaureate, master's, and doctoral levels.

1. USM should invest in nursing enrollment growth, working toward a target of 10 percent overall enrollment growth within five years.

As noted earlier, among Maryland's health care professionals, registered nurses are in the highest demand, with 3,450 estimated openings per year through 2023. USM institutions awarded 1,427 nursing degrees in 2017, thereby meeting 41 percent of the projected need. Table N–3 provides information on fall 2017 enrollment in USM nursing programs, by type of program. Table N–4 provides a snapshot of all nursing degrees awarded by USM nursing programs.

Despite various projections of oversupply among Maryland's RNs and primary care NPs as discussed earlier, we do not recommend reducing enrollment in USM's undergraduate and graduate nursing programs. Instead, we concur with Dr. Peter Buerhaus, a nurse and health care economist with two decades of experience in nursing workforce projections. He notes the difficulty in estimating nursing demand accurately—given the considerable number of factors affecting demand that are in constant flux—and advises state policymakers and nursing education administrators *against* reducing slots in nursing programs. "There are way too many uncertainties that could blow away any projected surplus," he says. "This is a good time for educators and employers to invest in better nurse preparation and for states to invest in their workforce commissions."[24]

Over the near-term—roughly five years—Maryland is on track to have a nursing shortage, and the state should invest in increasing slots in nursing programs to address that shortage. Nonetheless, we are cautious about forecasting a workforce deficit or surplus too far into the future, as those forecasts may prove faulty.

For example, several years ago, studies predicted a long-term deficit in pharmacists, and pharmacy school enrollment increased rapidly.[25] Those long-term job growth projections were overly optimistic, however, raising concerns about a potential glut of newly graduated pharmacists joining an unexpectedly oversaturated workforce.[26] [xviii] Thus, we hesitate to rely too heavily on current long-term projections and believe that the state and System should undertake a new long-term forecast of Maryland's nursing workforce supply and demand in 2023. The new Maryland Nursing Workforce Center at UMB, funded with an NSPII grant, could be instrumental in guiding this forecast.[xix]

We discussed a reasonable target for enrollment growth with additional financial investment by USM, and surveyed each USM nursing program regarding potential growth targets. Survey respondents indicated that 10 percent *overall* enrollment growth within a five-year window—that is, 10 percent total growth distributed among each institution's nursing degree programs—is both possible and desirable.

Ten percent enrollment growth across USM programs would produce an additional 453 nursing graduates in Maryland within five years (beyond the state's current output). Assuming non-USM institutions keep their nursing enrollments constant, this growth could significantly increase the share of Maryland's nursing workforce need that is met by USM—from 41 percent to 54 percent—and could increase the need met by *all* Maryland institutions from 64 to 77 percent.

Appendix N–F provides three data sets for each USM nursing program: 1) known areas of growth over five years; 2) other areas of growth over five years, dependent on additional financial investment; and 3) an estimate of the financial resources needed to achieve this growth. It is important to note that funding models vary among USM institutions, and therefore more detailed proposals for growth would need to be developed.

ENSURE ADEQUACY OF CLINICAL PLACEMENT SITES

Growth in USM's nursing programs is affected by many external circumstances, including the number of clinical placement sites available for entry-into-practice programs and advanced practice RN programs.[xx]

1. USM should advocate that out-of-state nursing programs be required to demonstrate that their students do not negotiate directly with clinical sites and/or providers for clinical placements, and that they do not compensate clinical sites for placements.

2. USM should advocate that clinical sites amend their policies so that in-state nursing programs are not required to pay for clinical placements.

3. USM nursing programs should leverage best practices in simulation, including optimizing the work that has been done with NSPII funding. Priority should be given to four specialty areas where clinical sites are the most difficult to secure—i.e., community/public health, psychiatric/mental health, obstetrics, and pediatrics.

4. USM should consider creating a regional simulation center.[xxi]

[xviii] See also: Lebovitz L, Eddington ND. (2018). Help Wanted: Commentary on Trends in the Pharmacist Workforce and Pharmacy Education. *American Journal of Pharmaceutical Education.*

[xix] Information on UMB's Maryland Nursing Workforce Center is available at *http://www.umaryland.edu/news/archived-news/september-2018/newspressreleaseshottopics/md-nursing-workforce-center-to-be-created-at-umb.php*

[xx] While this report discusses clinical placements in a later chapter, we find it relevant to discuss the issue here as well, within the context of nursing.

[xxi] Specific recommendations regarding simulation, complementary to these, are taken up in a later chapter.

Table N–3. Enrollment in Nursing Programs, By USM Institution and Student Level: Fall 2017

Institution	Undergraduate BS/BSN: Traditional and RN-to-BSN	Master's	DNP	PhD	Total
Bowie State University	193	59			252
Coppin State University	183	53	15		251
Frostburg State University	468	23			491
Salisbury University	195	3	39		237
Towson University	810	31			841
UMB—UMSON	841	512	473	48	1,874
UMUC	588				588
Total	3,278	681	527	48	4,534

Note: Undergraduate numbers do not include pre-nursing students; they include only those admitted to the major.

Table N–4. 10-Year Snapshot of USM Degrees in Nursing, by Level: FY 2007–FY 2017

Institution	FY 07	FY 08	FY 09	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17
	UNDERGRADUATE DEGREE										
Bowie	59	32	24	40	65	66	69	84	86	112	50
Coppin	69	90	67	56	80	134	101	136	85	85	67
Frostburg	0	0	0	0	4	10	16	51	97	139	155
Salisbury	68	76	83	70	84	87	93	86	94	90	97
Towson	110	131	128	153	152	162	184	186	200	241	272
UMB–UMSON	310	294	282	314	301	281	275	287	292	364	378
UMUC	0	0	0	0	0	0	0	0	7	44	97
Subtotal	616	623	584	633	686	740	738	830	861	1,075	1,116
Growth Over Previous Year		1.1%	-6.3%	8.4%	8.4%	7.9%	-0.3%	12.5%	3.7%	24.9%	3.8%
	GRADUATE DEGREES (Master's, DNP, and/or PhD)										
Bowie	11	5	0	12	3	22	28	53	46	42	30
Coppin	9	10	3	7	7	4	13	8	18	9	13
Frostburg	0	0	0	0	0	0	0	0	0	0	12
Salisbury	2	8	4	4	14	8	17	6	14	3	2
Towson	16	12	25	15	37	16	26	28	24	20	18
UMB–UMSON	222	240	288	321	326	362	339	303	374	272 [xxii]	236
Subtotal	260	275	320	359	387	412	423	398	476	346	311
Growth Over Previous Year		5.8%	16.4%	12.2%	7.8%	6.5%	2.7%	–5.9%	19.6%	–27.3%	–10.1%
TOTAL	876	898	904	992	1,073	1,152	1,161	1,228	1,337	1,421	1,427
Growth Over Previous Year		2.5%	0.7%	9.7%	8.2%	7.4%	0.8%	5.8%	8.9%	6.3%	0.4%

[xxii] The decline in graduate degrees awarded by UMB–UMSON is due to the conversion of the Master's Degree Advanced Practice Registered Nurse program to the Doctor of Nursing Practice starting in fall 2014. Implementation of the BSN-to-DNP option will take five years.

Over time, clinical group sizes for entry-level programs have contracted from eight students to four-to-eight students. And clinical sites in obstetrics, pediatrics, and mental health are especially challenging to secure. For example, Table N–5 provides a seven-semester snapshot of the number of entry-level clinical sections offered at the University of Maryland School of Nursing, the total enrollment of entry-level students at the Baltimore and Universities at Shady Grove (USG) locations, and the average clinical section size by specialty.

Additional reductions in the average clinical group size are expected as the acuity of patients seen in hospital settings increases, and all USM entry-level programs are reporting a similar pattern of reduced clinical group sizes.

Table N–5. Clinical Sections, Enrollment, and Average Clinical Group Size for Entry-Level Nursing Students at the University of Maryland School of Nursing[xxiii]

		Spring 2016	*Summer 2016*	*Fall 2016*	*Spring 2017*	*Summer 2017*	*Fall 2017*	*Spring 2018*
Obstetrics	Sections	21	17	25	27	20	30	30
	Enrollment	126	98	152	148	107	166	162
	Average	6.00	5.76	6.06	5.48	5.35	5.53	5.40
Pediatrics	Sections	22	18	26	28	19	28	29
	Enrollment	125	101	152	149	105	166	163
	Average	5.68	5.61	5.85	5.32	5.52	5.93	5.62
Psychiatric/ Mental Health	Sections	29		29	33		29	32
	Enrollment	203		197	205		215	207
	Average	7.00		6.79	6.21		7.41	6.4
Adult Health	Sections	29		31	33		33	34
	Enrollment	207		213	228		206	219
	Average	7.14		6.87	6.91		6.24	6.44
Total	Sections	101	35	111	121	39	120	125
	Enrollment	661	199	714	730	203	753	751
	Average	6.54	5.69	6.43	6.03	5.21	6.28	5.96

USM graduate programs are also seeing increased competition for clinical experiences for their students, due in part to the growth of for-profit higher education institutions. A customized enrollment report was requested from AACN for the purpose of determining the five largest nursing schools in the U.S. Table N–6 provides a summary of total enrollment by degree program for the five largest schools. For the sake of comparison, the University of Maryland School of Nursing was the 32nd largest program in 2016, with 1,803 nursing students across all degree programs.

In addition, *U.S. News & World Report (USNWR)* has ranked the best online master's programs in nursing.[27] The top 10 nursing schools offering at least one Nurse Practitioner program online comprise seven public institutions and three private institutions: 1) Medical University of South Carolina, 2) Duke University, 3) Ohio State University, 4) University of Cincinnati, 5) Catholic University of America, 6) Rush University, 7) University of Colorado–Colorado Springs, 8) University of South Carolina, 9) University of Pittsburgh, and 10) Ball State University.

[xxiii] Under "fall" and "spring," Table N–5 indicates entry-level BSN students and mater's entry CNL students; under "summer," the table indicates master's entry CNL students.

It is very likely that Maryland nurses who are enrolled in these large nursing schools and in the "best" online master's programs are attempting to complete their clinical/practicum requirements in-state and may be required to secure their clinical sites themselves.

Of the 15 nursing schools mentioned in Table N–6 and in the *USNWR* list, only two are indicated on the Maryland Higher Education Commission (MHEC) website as *Out-of-State Post-Secondary Institutions Offering Online Education in Maryland*: Chamberlain College of Nursing[28] [xxiv] and Walden University. [29] [xxv] With the exception of Chamberlain and Walden, all of the institutions identified in this section are members of the National Council for State Authorization Reciprocity Agreements.[30]

Table N–6. American Association of Colleges of Nursing: 2016 Enrollments by Degree/Program—Five Largest Nursing Programs

School	Total Nursing Enrollment	Generic Bacc.	RN-to-Bacc.[xxvi]	Master's	DNP	PhD
Chamberlain College of Nursing [xxvii]	29,590	8,931	11,779	8,127	753	–
Western Governors University [xxviii]	19,381	380	14,016	4,985	–	–
Grand Canyon University [xxix]	14,741	628	8,173	5,484	455	–
University of Texas–Arlington [xxx]	12,740	1,030	8,494	3,143	42	31
Walden University [xxxi]	12,084	–	1,895	9,043	894	252

According to Maryland regulation, the Maryland Board of Nursing "must review and approve an applicant's Nurse Practitioner educational program before it issues Nurse Practitioner certification to practice in Maryland."[31] The board requires the following information on clinical requirements as part of the approval process:

- Examples of the facilities or practice settings used for clinical practice sites for the NP specialty;
- Name and credentials of preceptors (if other than faculty);
- How students are evaluated in clinical settings; and
- Number of clinical practice program hours.

[xxiv] BSN – Arlington, VA, classrooms and clinical sites; MSN online – Educator, Executive, Informatics, Health Care Policy, FNP; DNP online – Advanced Leadership, Health Care Systems Leadership; Graduate Certificate online – Nursing Education and Nurse Informatics. [RN–BSN is listed as "out-of-state."]

[xxv] DNP and MSN – Adult–Gerontology Nurse Practitioner, Adult–Gerontology Acute Care Nurse Practitioner, Family Nurse Practitioner, Leadership and Management, Nursing Education, and Nursing Informatics. [BSN was approved as "out-of-state."]

[xxvi] The five largest nursing schools offer the RN-to-Baccalaureate online.

[xxvii] Per Chamberlain College of Nursing's website, the college offers the following master's specialties online: Executive, Informatics, Health Policy, Educator, and Family Nurse Practitioner. The college also offers the DNP online for registered nurses and advanced practice registered nurses.

[xxviii] Per Western Governors University's website, the university offers the following master's specialties online: Education, Leadership and Management, and Nursing Informatics.

[xxix] Per Grand Canyon University's website, the university offers the following master's specialties online: Adult/Gerontology Acute Care Nurse Practitioner, Family Nurse Practitioner, Health Care Informatics, Nursing Education, Nursing Leadership in Health Care Systems, and Public Health. It also offers a DNP online for advanced practice registered nurses, nurse informaticians, and nurse leaders.

[xxx] Per University of Texas–Arlington's website, the university offers the following master's specialties online: Nursing Administration, Education, Family Nurse Practitioner, Pediatric Nurse Practitioner Primary Care, Pediatric Nurse Practitioner Acute Care, Adult–Gerontology Primary Care Nurse Practitioner, and Adult–Gerontology Acute Care Nurse Practitioner. The university also offers the DNP online.

[xxxi] Per Walden University's website, the university offers the following master's specialties online: Leadership and Management, Nursing Education, Nursing Informatics, Public Health Nursing, Psychiatric/Mental Health Nurse Practitioner, Adult–Gerontology Primary Care Nurse Practitioner, Adult–Gerontology Acute Care Nurse Practitioner, and Family Nurse Practitioner. It also offers the DNP and PhD programs online.

MHEC is guided by COMAR 13B.02.01: Requirements for Authorization of Out-of-State Degree-Granting Institutions to Operate in Maryland. "Operate in Maryland" means to:

(a) Establish or provide a physical location in the State for students to receive synchronous or asynchronous instruction for credit leading to a degree or certificate;

(b) Require students to physically meet in a location in the State for instructional purposes more than twice during a full-term (quarter or semester) course for a total of more than six hours; or

(c) Have more than 10 students, in a single program, placed simultaneously at one site in the State in a supervised internship, practicum, or field experience as a required part of a degree or certificate program, unless the internship, practicum, or field experience:

(i) Is arranged and administered by a national placement center;

(ii) Occurs at the National Institutes of Health, the U.S. Food and Drug Administration, or another federal agency that, in the determination of the Secretary, recruits students nationwide from eligible academic programs, regardless of the student's specific institution of higher education; or

(iii) In the determination of the Secretary, has de minimis contacts with Maryland and is subject to the sufficient oversight of another regulatory body or government agency.[32]

Given this definition, it is very unlikely that out-of-state nursing programs offering graduate degrees would place 10 students simultaneously at one site. And yet, of the 15 nursing schools indicated in this section, 14 offer Nurse Practitioner education (Western Governors does not) and are recognized by the Maryland Board of Nursing.[33] The Board has recognized more than 340 institutions outside Maryland that grant post-master's certifications, master's degrees, and/or DNPs in advanced practice.

The acute demand for clinical placements in Maryland—and its significant potential to inhibit the number of nursing graduates we produce—necessitates that nursing students enrolled in in-state programs be given placement priority.

Therefore, we recommend that USM work with MHEC and the Maryland Board of Nursing to secure assurances that out-of-state nursing programs will be required to demonstrate that: 1) their students do not negotiate directly with clinical sites and/or providers for clinical placements; and 2) they do not compensate clinical sites for placements. We further recommend that USM work with the Maryland Hospital Association, the Maryland Health Services Cost Review Commission, and individual hospitals to secure an agreement that clinical sites will not require in-state nursing programs to pay for clinical placements.

Finally, given that high-quality simulation has been shown effective in supplementing supervised clinical experiences, we recommend that USM leverage best practices in simulation, especially where clinical sites are the most difficult to secure. The Simulation Facilities chapter explores this issue in much more detail.

ENSURE A STABLE AND SUFFICIENT CLINICAL FACULTY CORPS

Nursing faculty shortages limit nursing programs' student capacity at a time when Maryland and the nation can ill-afford constrictions on enrollment.

1. USM should clarify how System institutions may expand their full-time nursing faculty lines beyond their current total counts/limits and include specific guidance on budgeting requirements to expedite approval.

2. USM should explore ways to support nursing programs so that they have adequate numbers of full-time nursing faculty lines that are not constrained by an institution's total counts/limits.

3. USM should fund implementation of the Policy on the Employment of Adjunct Faculty in the University System of Maryland—as it relates to Adjunct II faculty—and should recommend that Adjunct II faculty be implemented across all nursing programs, with a 15 percent increase in compensation.

4. USM should undertake a review of nursing faculty salaries in a bid to achieve comparability with salaries earned by nurses in clinical practice.

AACN continues to monitor faculty shortages and their impact on nursing enrollments. The group endorses expanding enrollment in graduate programs, especially in doctoral programs, a recommendation consistent with the Institute of Medicine's call to double the number of doctorally prepared nurses by 2020.[34]

- As noted earlier, AACN reports that U.S. nursing schools turned away 69,188 qualified applicants from baccalaureate and graduate nursing programs in 2017 due to an insufficient number of faculty, clinical sites, classroom space, clinical preceptors, and budget constraints. Most nursing schools responding to the survey pointed to faculty shortages as a reason for not accepting all qualified applicants into baccalaureate programs.[35]

- AACN's Special Survey on Vacant Faculty Positions (2017–18) identified a total of 1,565 full-time faculty vacancies in a survey of 832 U.S. nursing schools with baccalaureate and/or graduate programs. In addition to filling vacancies, 128 schools reported a need for additional faculty positions to accommodate student demand. The data show a national nurse faculty vacancy rate of 7.3 percent. Most of the vacancies (87.6 percent) are in positions requiring or preferring a doctoral degree.[36]

To compensate for faculty shortages, most U.S. nursing schools augment a relatively small full-time doctorally prepared faculty with a large adjunct clinical teaching faculty. All Maryland nursing programs rely on qualified adjunct faculty, and the vast majority of adjuncts provide clinical instruction in entry-level programs.

To ensure continuity in instruction and to recoup the investment of time and resources associated with developing highly effective adjuncts, it is critical that adjunct faculty be willing to maintain their affiliation with a nursing program over multiple semesters. Consequently, we recommend that the Policy on the Employment of Adjunct Faculty in the University System of Maryland (II–1.07)—as it relates to Adjunct II faculty—be implemented across all nursing programs, with a 15 percent increase in compensation.[xxxii] Table N–7 summarizes the funding needed to implement the Adjunct II policy.

[xxxii] UMB–UMSON has operationalized "Adjunct II" as a faculty member who teaches at least one clinical section for six semesters within a five-year window.

Further, we recommend that USM: 1) clarify how System institutions may expand their full-time nursing faculty lines beyond their current total counts/limits—this clarification would include specific guidance on budgeting requirements to expedite approval; and 2) explore ways to support nursing programs so that they have adequate numbers of full-time nursing faculty lines unconstrained by those limits. For example, USM might support a different human resources code for select nursing faculty (e.g., clinical track-ranked faculty).

Finally, we recommend that USM take up a review of nursing faculty salaries within the System with the goal of shrinking the gap between the salaries of nurses in academia and those in clinical practice. One approach is to replicate the work that was done in Virginia in 2008.[xxxiii]

Table N–7. Total Costs Associated With Implementing the Adjunct II Policy for Adjunct Nursing Faculty With a 15 Percent Salary Adjustment

Institution	Estimated Annual Incremental Expense	Estimated Number of Adjunct II Faculty
Bowie	$21,000	10
Coppin	$56,250	52
Frostburg	$7,400	2
Salisbury	$16,360	8
Towson	$70,000	27
UMB–UMSON	$191,000	66
UMUC	N/A—no clinical faculty	N/A
Total	$362,010	165

IMPROVE NCLEX-RN PASS RATES

We cannot afford to graduate entry-level nursing students only to lose them to a failed licensure exam.

1. USM should provide financial support for a USM Nursing Faculty Two-Day Summit that showcases best practices for improving first-time candidates' pass rates on the NCLEX-RN.

2. USM should offer financial support to hire consultants who will work with any USM nursing program consistently performing below the Maryland Board of Nursing pass rate of 77.60 percent (and with any other USM nursing program expressing interest).

Table N–8 shows the five-year trend for NCLEX-RN pass rates among first-time candidates at USM institutions. Pass rates among repeat exam takers are lower than those among first-time candidates. In 2017, only 45.56 percent of candidates nationwide who retook the NCLEX-RN passed the exam, compared with 87.11 percent of first-time exam takers.[xxxiv]

[xxxiii] Available at: *http://www.schev.edu/docs/default-source/Reports-and-Studies/2008/nursingfacsal1008.pdf?sfvrsn=4*
[xxxiv] Available at: *https://www.ncsbn.org/Table_of_Pass_Rates_2017.pdf*

To gain a better understanding of how USM entry-level nursing programs support student success on the NCLEX-RN, nine exam-related questions were included in the survey sent to USM provosts. The results appear in Appendix N–G.

We recommend that USM provide financial support for a Nursing Faculty Two-Day Summit that showcases best practices for optimizing first-time candidates' success on the NCLEX-RN. Each institution would be invited to send up to five nursing faculty champions to the summit, and USM would cover all summit expenses. The estimated cost associated with UMSON hosting this two-day summit is $31,664. The proposed summit budget is detailed in Appendix N–H.

Additionally, we recommend that USM offer financial support to hire consultants who will work with any USM nursing program consistently performing below the Maryland Board of Nursing's NCLEX-RN pass rate of 77.60 percent—and with any other USM nursing program expressing interest. These consultants would make recommendations to each institution's provost and to each program's dean. The estimated cost for securing these consultants is $109,592. Appendix N–I provides additional budget details.

Table N–8. NCLEX-RN First-Time Candidate Performance, USM Nursing Programs: BS/BSN And Master's Entry Nursing Programs

University	July 1, 2013–June 30, 2014		July 1, 2014–June 30, 2015		July 1, 2015–June 30, 2016		July 1, 2016–June 30, 2017		July 1, 2017–June 30, 2018	
	First-Time Testers	Passing Rate	First-Time Testers	Passing Rate	First-Time Testers	Passing Rate	First-Time Testers	Passing Rate	First-Time Testers	Passing Rate
Bowie	72	52.78%	73	41.10%	67	71.64%	94	58.51%	56	67.86%
Coppin	70	67.14%	116	62.07%	85	76.47%	48	79.17%	47	76.60%
Salisbury	84	89.29%	102	90.20%	84	92.86%	92	91.3%	83	98.80%
Towson	176	83.52%	150	88.67%	189	82.54%	188	87.23%	151	90.07%
UMSON BSN	235	89.79%	213	92.96%	250	87.60%	247	87.04%	293	89.08%
UMSON Entry MS	81	88.89%	70	91.43%	44	84.09%	86	84.88%	88	87.50%
All U.S. Candidates	155,335	82.56%	159,528	82.53%	161,156	83.94%	159,419	86.22%	157,001	87.81%

Note 1: *These statistics are provided by the National Council of State Boards of Nursing and Pearson VUE.*
"All U.S. candidates" includes all Maryland RN first-time candidates who graduated from Maryland nursing schools and tested in any U.S. jurisdiction between July 1 and June 30 of the years listed in the table.
Note 2: *The Maryland Board of Nursing requires a pass rate of 77.60 percent for Maryland RN nursing programs/schools.*

CLINICAL PARTNERSHIPS AND PLACEMENTS

Without question, clinical training is the backbone of health professionals' preparation for practice.

However, throughout USM, academic programs have difficulty sustaining and supporting clinical placements—both for current enrollments and for potential enrollment growth.

MEMBERS

Marcie Weinstein (chair)	Associate Dean, College of Health Professions *Towson University*
Fermin Barrueto	Senior Vice President for Medical Affairs and Chief Medical Officer *University of Maryland Upper Chesapeake Health*
Matthew Lasecki	Associate Vice President and Chief Human Resource Officer *University of Maryland, Baltimore*
Jill Morgan	Chair, Department of Pharmacy Practice and Science *University of Maryland School of Pharmacy*
Laura Pimentel	Vice President and Chief Medical Officer *University of Maryland Emergency Medicine*
Lisa Rowen	Chief Nurse Executive *University of Maryland Medical System* Senior Vice President for Patient Care Services and Chief Nursing Officer *University of Maryland Medical Center*
Elizabeth Throop	Provost and Vice President for Academic Affairs *Frostburg University*

Charged with investigating overall clinical placement needs and practices in key health professions, we focused on the relationship between academic institutions and health care delivery systems as they collaborate to provide clinical education. We examined clinical site sufficiency, benefits, and challenges—from the perspectives of educators *and* preceptors—as well as the costs of clinical education.

Using two surveys—one distributed to academic deans and directors of USM health programs, and one distributed to USM's primary clinical partners—we identified current challenges and, from the feedback we gleaned, suggest the following improvements:

1. Alleviate shortages of clinical placements in critical practice areas
2. Enhance preceptor productivity and mitigate burnout by laying in resources for preceptor development, mentoring, incentives, and support
3. Commit University of Maryland Medical System (UMMS) member hospitals to give priority placement to USM students, without the expectation of compensation, and expand the use of non-monetary compensation to clinical partners
4. Streamline the onerous administrative and logistical responsibilities inherent in clinical education
5. Establish dedicated relationships and systems that yield predictable placement sites
6. Improve coordination across systems and institutions to identify and address anticipated concerns, needs, and opportunities
7. Increase curricular collaboration between academic and health care institutions
8. Support residency program growth with creative funding sources and expand residencies in non-hospital placements
9. Undertake a comprehensive assessment of clinical training in terms of costs, benefits, and outcomes.

THE STATE OF CLINICAL PLACEMENTS IN MARYLAND

To initiate a comprehensive review of the state of clinical education in Maryland, we developed an initial set of questions to guide our work, as follows:

1. What are the critical disciplines having the greatest clinical placement needs?
2. What is the status of clinical placements in these disciplines, e.g., number of annual placements and student level (pre-licensure, post-graduate) for placements?
3. What are the barriers for academic programs in maintaining a sufficient number of quality clinical placements?

4. What are the barriers for health care institutions in supervising/precepting health professions students?
5. What are the issues related to costs of clinical education?
6. What innovative models or supervisory strategies are sites and schools using successfully to meet clinical placement needs?
7. How can existing health care and academic institutions work together to expand the number of placements?
8. How can USM provide additional resources or support for student clinical training?

The survey we developed from these broad questions was based on a similar survey distributed in 2013 by several national health care organizations.[37]

While collecting information about all programs, we prioritized medicine, nursing, physician assistant (PA), pharmacy, physical therapy, occupational therapy, speech-language pathology, and audiology as high-demand fields. We sent out 27 questionnaires and 22 were completed. Survey questions focused on academic educators' concerns with new and/or existing sites, challenging practice areas, competition for sites, incentives for clinical preceptors,[xxxv] and successful strategies for maintaining relationships.

We then asked our academic respondents to distribute a separate questionnaire that we had prepared to their clinical preceptors and supervisors, so that we could elicit perceptions and concerns from the standpoint of their facility partners. The number of surveys distributed is unknown; we received 75 responses. Primarily, we wanted to determine the types of clinical sites most commonly used and respondents' perceptions of the benefits and challenges of providing clinical education.

Table C–1 is a snapshot of the clinical education activity occurring across USM every year. Collectively, more than 21,000 student placements are made annually; these numbers are estimates and may actually be a bit higher. Placements vary in length and format—for example, pre-licensure nursing students are placed in groups of 4–8 at a clinical site, and small groups of medical students are embedded with physician teams; most other students are placed in a 1:1 model. Student placements range in length, with the majority occurring between five and 12 weeks in a full-time format. Students generally complete more than one placement in a year; PA students, for instance, complete eight different rotations annually.

Approximately 80 percent of placements occur at the pre-licensure level, which requires close and often direct supervision. The clinical placement process overall requires sufficiency of sites and rigorous organization to coordinate the many complex components, and is stressed by the high volume of placements needed.

[xxxv] The term "preceptor" is used throughout this report to represent all facility-based personnel responsible for student training. This includes clinical preceptors, supervisors, and instructors.

Table C–1. Clinical Placements by USM Institution

Institution	Annual Placements (estimated)	Institution	Annual Placements (estimated)
Bowie State University	***984***	***Salisbury University***	***2,437***
Nursing (BSN)	924	Athletic Training (BS)	20
Nursing (MSN)	60	Respiratory Therapy (BS)	60
Coppin State University	***4,613***	Community Health (BS)	180
Nursing (BSN)	2,139	Exercise Science (BS)	330
Nursing (graduate)	113	Nursing (BSN)	1,600
Frostburg State University	***120***	Nursing (DNP)	168
Nursing (BSN)	120	Nursing (MSN)	87
Nursing (MSN)	0*	***UMB***	***9,893***
Towson University	***4,516***	Nursing (BSN)	3040
Audiology (AuD)	96	Nursing (MSN)	105
Athletic Training (BS)	120	Nursing (entry-level MS)	770
Community Health (BS)	350	Nursing (RN-to-BSN)	87
Nursing (BSN)	2,800	Nursing (DNP)	630
Nursing (MS)	64	Pharmacy (PharmD)	1,600
Occupational Therapy (MS)	480	Physician Assistant (MS)	400
Physician Assistant (MS)	396	Medicine (MD)	3,040
Speech-Language Pathology (MS)	210	Physical Therapy (DPT)	300
University of MD, College Park	***94***	***UMES***	***721***
Audiology (AuD)	24	Pharmacy (PharmD)	720
Speech-Language Pathology (MS)	70	Physical Therapy (DPT)	120
		USM Estimated Annual Total	***21,136***

* Program begins fall 2018

ACADEMIC EDUCATOR PERSPECTIVES

Every USM institution with health-related academic programs was surveyed, and 22 responses were received from Coppin State University, Frostburg State University, Salisbury University, Towson University, UMB, the University of Maryland, College Park (UMCP), and UMES. Twelve disciplines were represented, as seen in Table C–2, with the greatest preponderance in nursing. In addition to survey responses, information was collected through individual conversations with academic clinical coordinators and program directors.

Table C–2. Academic Survey Respondents

Discipline	No. of Respondents	Discipline	No. of Respondents
Athletic Training	2	Occupational Therapy	1
Audiology	1	Pharmacy	2
Community Health	2	Physical Therapy	1
Exercise Science	1	Physician Assistant	2
Medical Laboratory Science	1	Respiratory therapy	1
Nursing	6	Speech-Language Pathology	2

Respondents were asked to indicate every type of site at which their students are placed for clinical training. As seen in Table C–3, the most common sites are long-term care,[xxxvi] private practices, outpatient centers, and acute care.

Table C–3. Clinical Placement Sites Used by Academic Programs

Placement Site	Share of Respondents	Placement Site	Share of Respondents
Acute Care	69%	Urgent Care Centers	32%
Emergency/Trauma	50%	Sub-Acute Care	64%
K–12 Schools	55%	Rehabilitation Centers/Hospitals	59%
Long-Term Care	77%	Community Health Centers	64%
Private Practices/Private Offices	77%	Correctional Medicine	27%
Outpatient Centers	77%		

Note: *Most respondents noted multiple sites.*

To get an overall sense of the major issues, we asked educators about their clinical placement concerns. Very clear concerns emerged (Table C–4): 95 percent are concerned about the number of clinical training sites; 81 percent about access to qualified preceptors in specialty areas; and 77 percent about access to preceptors in primary care.

Table C–4. Level of Concern Regarding Adequacy of Clinical Opportunities for Students

	Not Concerned	Somewhat Concerned	Very Concerned	N/A
Number of clinical training sites	5%	45%	50%	0%
Patient diversity (e.g., age, race, gender, sexual orientation)	45%	41%	9%	5%
Supply of qualified preceptors in specialty areas	14%	36%	45%	5%
Diversity of medical conditions	32%	55%	9%	5%
Supply of qualified preceptors in primary care	14%	36%	41%	9%

Educator concern over the number of clinical sites is clear; we then asked respondents to indicate the level of difficulty in both maintaining existing clinical sites and creating new clinical sites for their students, as compared to 2–3 years ago. Table C–5 illustrates increasing difficulty in both areas. While nearly one-third indicated no change, more than two-thirds found the process more difficult. Noteworthy is the finding that maintaining existing relationships is as difficult as making new ones.

[xxxvi] It is important to note that long-term care facilities nationwide are experiencing a shortage of health professionals, and that high-quality placements in these facilities, especially among nursing students, is critical to attracting a workforce sufficient to care for the country's aging population. In a 2018 analysis by the Long Term Care Community Coalition, 70 percent of skilled nursing facilities in the U.S. report RN care below 30 minutes per resident per day, while studies estimate that meeting the clinical needs of each resident requires 33 to 45 minutes of RN care each day. Moreover, 82 percent of skilled nursing facilities report total direct care at four or fewer hours per resident per day, while the appropriate amount of direct care is 4.1 hours per resident per day. See *https://skillednursingnews.com/2018/03/registered-nurse-staffing-falls-short-nursing-homes/.*

Table C–5. Difficulty of Maintaining Existing and Creating New Clinical Training Sites, Compared With 2–3 Years Ago

Change in Difficulty	Maintaining Existing Training Sites	Creating New Training Sites
Much less difficult	0%	0%
Somewhat less difficult	0%	0%
No change	30%	30%
Somewhat more difficult	57%	40%
Much more difficult	13%	30%

Health professions education associations nationwide are grappling with issues related to access in specific practice areas. Not only do students need well-rounded exposure to become competent clinicians, they need this preparation in order to pass entry licensure exams. Health professions programs, meanwhile, need adequate placements to meet accreditation standards. Respondents were asked to indicate all practice areas for which they have difficulty finding clinical training sites (Table C–6). The areas of greatest difficulty are in pediatrics, primary care, psychiatry, and obstetrics/gynecology.

Table C–6. Practice Areas for Which Educators Have Difficulty Finding Sites

Discipline	Share of Respondents	Discipline	Share of Respondents
Family Medicine	24%	Community	29%
Pediatrics	71%	Neurology	0%
Psychiatry/Mental Health	38%	Extended Rehabilitation	14%
General Surgery	14%	Acute Care Rehabilitation	19%
Specialty Surgery	5%	Long-Term Care	19%
Radiology	5%	Aging/Gerontology	5%
Emergency	10%	Speech-Language Pathology/Audiology	10%
Orthopedics	5%	Family Therapy	5%
Inpatient Medicine/Surgery	19%	Occupational/Industrial Setting	5%
Internal Medicine	10%	Athletic Training	5%
Obstetrics/Gynecology/Women's Health	38%	Primary Care	33%

Educators were asked to indicate the degree of importance and level of difficulty of specific tasks when creating new clinical training sites. As indicated in Table C–7, all are considered "important" and "difficult." The three most important and most difficult tasks are the same:

1. Recruitment of individual preceptors or units willing to accept student interns
2. Student documentation, including immunizations and background checks
3. Development of affiliation agreements, liability coverage, and related legal issues.

Table C–7. Level of Importance and Degree of Difficulty in CREATING NEW Clinical Training Sites

	Not Very Important	Important	Not Very Difficult	Difficult
Management of the administrative elements (e.g., files, forms, scheduling, coordination)	17%	83%	29%	71%
Development of affiliation agreements, liability coverage, related legal issues	4%	96%	14%	86%
Student documentation (e.g., immunizations, background checks, required trainings, EHR training)	4%	96%	24%	76%
Recruitment of individual preceptors or units willing to accept student interns	0%	100%	10%	90%
Training and orientation of preceptors; design of overall expectations for student learning	13%	87%	38%	62%
Changes in supervision policies related to billing and reimbursement	48%	52%	62%	38%

Respondents were asked to indicate the level of importance and degree of difficulty for the same tasks when maintaining existing clinical training sites for their students (Table C–8). With the exception of reimbursement policy, all tasks are seen as important. However, managing these tasks is considered less difficult with existing sites when compared with new sites. The major exception is preceptor recruitment, which continues to be difficult, even with existing sites.

Table C–8. Level of Importance and Degree of Difficulty in MAINTAINING EXISTING Clinical Training Sites

	Not Very Important	Important	Not Very Difficult	Difficult
Management of the administrative elements (e.g., files, forms, scheduling, coordination)	14%	86%	38%	62%
Development of affiliation agreements, liability coverage, related legal issues	10%	90%	48%	52%
Student documentation (e.g., immunizations, background checks, required trainings, EHR training)	5%	95%	43%	57%
Recruitment of individual preceptors or units willing to accept student interns	0%	100%	19%	81%
Training and orientation of preceptors; design of overall expectations for student learning	14%	86%	57%	43%
Changes in supervision policies related to billing and reimbursement	48%	52%	67%	33%

One of the questions driving this investigation concerns the ability of our academic programs to meet the need for qualified health practitioners in Maryland. We asked programs about the impacts of three issues on enrollment capacity:

1. Clinical site availability
2. Competition
3. Compensation

As seen in Table C–9, more than half of respondents indicated that competition for sites has a negative effect on enrollment. Site availability is a factor reported by nearly half of respondents. Most disciplines reported competing for sites with other programs within their disciplines, but competition also occurred between Advanced Practice Nurse and PA students, and with students from offshore medical schools because of the schools' generous compensation to clinical sites.

Table C–9. Factors Affecting Enrollment Capacity

	Negative Effect on Enrollment	No Effect on Enrollment	Positive Effect on Enrollment
Number of available sites	45%	50%	5%
Quality of available sites	36%	55%	9%
Availability of specific specialty sites	45%	50%	5%
Competition with other schools in my professions for available sites	59%	32%	9%
Competition with schools outside my profession for available sites	32%	64%	5%
Payment requirements associated with fieldwork sites	32%	64%	5%
Changes in supervision policies related to billing & reimbursement	23%	73%	5%

Academic programs use a variety of incentives with their clinical partners who supervise students. Table C–10 indicates the most common incentives used. When asked which they consider most effective, educators said the following have the greatest impact:

1. Continuing education credit
2. Other educational opportunities
3. Access to student assistance for ongoing projects

Table C–10. Incentives Provided to Clinical Training Sites by Programs/Institutions

Incentive	Share of Respondents	Incentive	Share of Respondents
Provide financial compensation	30%	Offer other educational opportunities for preceptors/staff	35%
Offer continuing education credits or opportunities	55%	Offer library access	25%
Offer faculty appointments to preceptors	20%	Provide clinical educator retreats, dinners, or recognition ceremonies	10%
Offer faculty development opportunities	8%	Provide public recognition—e.g., at state conferences, award receptions	8%
Provide on-site events—e.g. staff lunch with thank-you gifts	10%	Allow free course auditing	0%
Provide free or reduced-cost access to athletic and/or arts events on campus	0%	Link student projects to facility needs so students assist ongoing projects	45%
Provide personnel time/assistance for coordination of placements	6%		

Similarly, academic programs use a number of tools designed to maintain positive working relationships with their health care partners. The most frequently used strategies are identified in Table C–11. The two strategies selected by the highest number of respondents are: 1) review of student evaluations with preceptors; and 2) regular site visits. Of note is the fact that educators also ranked these strategies as the most effective, reflecting the importance of the interpersonal connection between partners in maintaining strong and ongoing relationships.

Table C–11. Strategies Used by Academic Institutions to Maintain Effective Working Relationships With Their Health Care Partners

Strategy	Share of Respondents
Offer regular preceptor training or other fieldwork-related workshops	32%
Actively involve preceptors in curricular planning and updates	32%
Regularly review student evaluations of clinical sites as well as preceptor evaluations	77%
Provide online preceptor resources	36%
Schedule regular site visits to observe students and preceptors	68%
Make faculty available for guest lectures and for student preparation prior to clinical placement	23%
Offer opportunity for students to contribute to projects initiated by health care partners	41%

Educators were asked about other practices they have adopted—as a program or institution—to address shortages in clinical training sites. As seen in Table C–12, schools use a wide range of strategies to supplement or address their current site needs. Several programs reported creative arrangements with sites, including students practicing with other disciplines, sites accepting students in exchange for valued services, and split placements. The most commonly reported strategies are:

1. Expanding the search radius for clinical training sites
2. Strategic relationship building
3. Increased student-to-preceptor ratio
4. Simulation

Table C–12. Practices Adopted by Institutions/Programs to Address Shortages in Clinical Training Sites and Preceptors

Practice	Share of Respondents
No shortage of clinical training sites	14%
Simulation (e.g., manikins, standardized patients, avatars)	23%
Part-time preceptors	18%
Expanded radius to search for clinical sites	68%
Independent study/graduate projects/research activities	5%
Supplemental didactic or computer-based curriculum for students	5%
Strategic relationship building (e.g., targeting area alumni, building on part-time faculty places of employment)	32%
Telehealth/telemedicine	9%
Increased student-to-preceptor ratio	32%
Part-time clinical placements for extended time	14%
Creative arrangements	23%
Increased use of on-campus (academic) placement opportunities	14%
Interprofessional education	14%

Finally, we asked educators to describe their experiences regarding financial compensation practices with their partner clinical training sites. Table C–13 illustrates the pressure they feel from sites to provide compensation, and reflects greater pressure from new sites than existing ones.

Table C–13. Pressure to Compensate New and Existing Clinical Training Sites

	No/Little Pressure	Moderate Pressure	High Pressure
Existing sites	65%	24%	12%
New sites	47%	42%	11%

Describing their actual practices, 30 percent of respondents reported that they currently provide financial compensation. Of those that do compensate their clinical partners, most did so using added student fees, as show in Table C–14.

Table C–14. Sources of Funding for Compensation Provided to Clinical Training Sites

Funding Source	Share of Respondents
Increased tuition	33%
Increased student fees	50%
Reallocated money from other parts of the budget	33%

CLINICAL PRECEPTOR PERSPECTIVES

The preceptor survey was designed to collect information from clinical site partners who supervise students from USM clinical education programs. Tables C–15 and C–16 describe the 75 respondents in terms of the types of sites and disciplines they represent.

Among facilities, most responses came from medical centers and community hospitals. Among disciplines, most responses came from occupational therapists. In order to assess any potential skew in the results, responses were analyzed across all respondents, across nursing respondents only, and across rehabilitation respondents only.

We asked preceptors to identify what they consider to be the benefits of accepting student placements. As illustrated in Table C–17, four major benefits emerged, including teaching opportunities and access to advances in evidence-based practice. Interestingly, potential new employee recruitment was listed as a benefit by 72 percent of respondents, but far fewer ranked the benefit as one of their top three. This varied a bit by discipline: Nursing and PA respondents ranked it higher, which may be due to more pressing workforce needs; rehabilitation respondents ranked it lower, possibly due to smaller employment numbers. Other respondents noted that providing clinical education to students "provides an extra set of hands/eyes while treating patients" and helps experienced clinicians gain "exposure to more recent teachings/research."

Table C–15. Respondents by Facility Type

Institution Type	Share of Respondents
Medical Center	28%
Community Hospital	31%
Outpatient Facility	15%
Rehab Setting	17%
Long-Term Care Facility	4%
Private Practice	8%
Mental Health Hospital	4%
School	8%
Hospice	1%
Local Health Department	1%
Note: Several respondents noted multiple sites.	

Table C–16. Respondents by Discipline

Discipline	Share of Respondents
Medicine	1%
Nursing	17%
Physical Therapy	1%
Audiology	13%
Speech-Language Pathology	11%
Occupational Therapy	44%
Physician Assistant	3%
Community Health	1%
Other/Unclear/Multiple Disciplines	8%

Table C–17. Perceived Institutional Benefits of Providing Clinical Education

Perceived Benefit	Among All Benefits	Among Top Benefits
Provides opportunity for employee recruitment	72%	23%
Provides an opportunity to give back to field	86%	47%
Provides opportunity for staff to engage in clinical teaching	91%	64%
Helps to emphasize best practices and evidence-based practice	82%	53%
Provides perks to preceptors/supervisors, such as university library access, continuing education credits, and affiliate faculty status	38%	8%
Provides access to students who can support institutional research activities	23%	4%

Our survey also asked preceptors to describe their greatest challenges in accommodating fieldwork students. As seen in Table C–18, two primary challenges emerged, related to administrative and scheduling burdens and increased workload for preceptors. Several respondents noted the additional staff resources needed to handle significant onboarding paperwork and the details of affiliation agreements, as well as overlapping and conflicting placement schedules. A number reported that preceptors are concerned about the added time and effort needed to manage students—that they work longer hours with diminished productivity. Comparing the list of all challenges and the list of most pressing challenges, one sees that the most common challenges are also the most problematic.

Staff stress and staffing changes—e.g., resignations and schedules changed from days to nights or to weekends—were commonly cited. A few respondents mentioned the substantial work involved in helping struggling students, inadequately prepared students, and students at the beginning of their clinical training. Two respondents described the challenges in more rural settings, where preceptors who commute long distances are required to add student supervision to their workload, and where student housing is limited.

We conducted further analysis to look for challenges specific to the nursing and rehabilitation disciplines. Clinical sites hosting nursing and rehabilitation students ranked administrative and scheduling challenges high among their concerns, as did all respondents.

Two-thirds of nursing respondents listed administrative paperwork and scheduling issues as their most pressing challenges. One-third noted concerns regarding preceptor burnout, but only 8 percent of nurses identified diminished preceptor productivity as a problem, possibly due to the clinical instructor model in which the students' direct supervision is delivered by a university employee versus a hospital employee.

In contrast, decreased supervisor productivity was the highest ranked challenge by rehabilitation respondents, likely due to the fact that direct supervision of students is provided by the hospital employee. Interestingly, one-third of rehabilitation respondents noted that poorly prepared students pose a problem, whereas no nursing respondents reported this as a challenge.

Table C–18. Perceived Institutional Challenges in Providing Clinical Education

Perceived Challenge	Among All Challenges	Among Top Challenges
Onboarding expenses	9%	4%
Decrease in preceptor productivity	38%	35%
Students' lack of preparedness for clinical placement	32%	27%
Administrative burden (e.g., fieldwork agreements, assignment schedules, clinical paperwork)	50%	42%
Limited preceptor interest in taking students; preceptor burnout	31%	24%
Scheduling challenges	49%	26%
Expense and time for preceptor training	9%	5%
Requests for placements beyond institutional capacity	30%	18%

Finally, we solicited general feedback from preceptors about working with students by asking for their agreement with a series of statements (Table C–19). All respondents strongly value their role in student training, and 95 percent indicate an interest in greater collaboration with schools. However, 60 percent confirm that they receive more placement requests than they can handle, and that additional resources would be needed in order to expand clinical education opportunities at their sites. Academic educators should note that 77 percent of responding preceptors indicate that student preparation factors into their selection process—that is, they are more likely to accept placements from schools whose students demonstrate a high level of skill and preparedness.

As before, responses were examined separately for the nursing and rehabilitation disciplines to detect differences. Only 25 percent of nursing respondents agreed that they avoid accepting students at the beginning of their training—below the all-respondent average—which is possibly attributable to nursing's clinical instructor model. Half of nursing respondents—down slightly from the average—noted that they receive placement requests beyond their capacity. Meanwhile, more than eight in 10 rehabilitation respondents—slightly higher than the average—noted that students' skill level influences their selection process. All other attitudes among the two disciplines were essentially the same as the general population of respondents.

Narrative comments further describe challenges among clinical sites. The concern regarding diminished student preparedness was repeated several times. One respondent remarked, "I love working with students, but am really seeing a decrease in preparedness at even the foundation level." Another noted that "for students in a demanding placement, it would be beneficial to ensure that they had a successful Level One [earlier experience] at an institution with adequate supervision and mentorship."

Other preceptor comments elaborated on the shortage of resources available to them as clinical preceptors, including computer work stations and work rooms to assign for student use. One respondent noted that preceptors prefer perks from universities such as library access over financial compensation, because any stipend they receive from universities gets absorbed into their facility as a whole and does not directly benefit their department.

Table C–19. Perceptions of Providing Clinical Education

	Do Not Agree	Agree	N/A
Providing clinical education training to health professions students is a value we feel strongly about	0%	100%	0%
We would like to have greater collaboration with the academic programs on curricular content and skill sets needed for internship	3%	95%	3%
Variations in skill level or preparedness among students from different schools influences from where we accept placement requests	15%	77%	8%
We avoid accepting students at the beginning of their clinical training because their skills are not sufficiently developed	59%	37%	4%
We routinely receive requests for student placements that are beyond our capacity	32%	60%	8%
Academic programs that do not offer financial compensation are disadvantaged in terms of number of placements compared with academic programs that do provide financial compensation	59%	22%	20%
We could expand the amount of clinical education we provide if we had additional resources to address costs and staffing needs	24%	60%	15%

PLACEMENT CHALLENGES BY DISCIPLINE

Following this broad analysis of perceptions from the standpoint of academic programs and their health care partners, our next step was to undertake a more detailed analysis of individual disciplines. In-depth interviews allowed us to describe the structure of clinical curricula, the number and format of clinical placements, and perspectives on clinical education needs unique to specific professions. Five summaries are presented: medicine, nursing, PA, pharmacy, and rehabilitation.

MEDICAL EDUCATION

The University of Maryland School of Medicine (UMSOM) is the only medical school in USM. The school admits 160 students annually into a four-year program, with the final two years primarily spent in clinical rotations. Up to 50 percent of student clinical rotation placements occur at the University of Maryland Medical Center (UMMC), and many of the remaining rotations are scheduled in UMMS facilities. Students rotate through the UMMC Midtown Campus, UM St. Joseph's Medical Center, UM Baltimore Washington Medical Center, and UM Rehabilitation and Orthopaedic Institute; students may soon begin rotations at UM Upper Chesapeake Medical Center. Students are not currently placed at UM Mt. Washington Pediatric Hospital. UMSOM has a partnership with Prince George's Hospital Center, and some students may be placed there for family medicine in the near future.

After two didactic years, medical students spend their third year in as many as eight distinct clinical rotations, which may include up to 14 different placements. Third-year students complete four weeks each in two different internal medicine placements; four weeks in general surgery and four weeks in a specialty surgical area, including two weeks in trauma; six weeks in obstetrics/gynecology, which is further divided into two-week placements in labor and delivery, gynecological surgery, and outpatient care; six weeks in pediatrics; four weeks each in psychiatry, family medicine, and neurology; and two four-week electives. Elective placements are approved by faculty in advance and are typically completed at UMMC or at the Baltimore VA Medical Center, in either an inpatient or outpatient location.

Clinical rotations also comprise the fourth year of medical school, during which more individualized schedules are developed to reflect students' interests in obtaining specific residency programs following graduation. Fourth-year students have greater involvement in selecting their own clinical sites and many go off-campus for selected experiences. All students fulfill a number of graduation requirements, including an outpatient rotation in an underserved setting, one month in an area of internal medicine (e.g., geriatrics, GI, cardiology), and two sub-internships.

Administering such a comprehensive program of clinical education requirements over the last two years of medical school presents a significant organizational and logistical burden. Clinical rotations are managed by several staff in the Office of Student Affairs. Each student's rotation schedule must be developed, monitored, and revised if needed. Students are typically scheduled in small groups and sent to different teams, where they are paired with attending physicians and residents. Every student's schedule is different, and the process of creating individualized schedules for fourth-year students can be quite labor-intensive for staff.

Other administrative tasks related to clinical placements are considerable as well. Everyone responsible for student clinical training in third-year rotations must have a faculty appointment. Maintaining numerous affiliation agreements is another burden; agreements have grown increasingly complex in recent years with more frequent legal involvement, and many sites have their own requirements that must be negotiated and agreed upon with the school's legal counsel. For example, VA medical facilities require more hands-on oversight for drug screening, criminal background checks, verification of citizenship and selective service status, etc. UMSOM is in discussions with UMMS about streamlining the agreements and paperwork requirements for different system sites, with a proposal to complete a uniform set of paperwork at the start of students' third year that would be accepted by every system facility; however, such a mechanism is not yet in place.

Compared with some other health care disciplines, medicine has relatively fewer challenges in finding qualified professionals to oversee students' clinical education. Because of the teaching mission of UMMC, attending physicians are required to accept medical students on their teams. However, while clinical teaching remains a major focus, emphases on generating clinical revenue and research dollars are competing factors. As usage of institutional sites grows beyond UMMS facilities, preceptor recruitment is made more difficult because student training is not mandated in these sites, and physicians often express a financial disincentive based on reduced productivity.

Similar to several related fields, the limited availability of pediatric and OB/GYN sites complicates student placements in these areas. Locally, UMSOM competes with Johns Hopkins for clinical sites outside of UMMS, and other medical schools—e.g., Georgetown—also place students in the area. In addition, the medical schools at George Washington University and Howard University add to the clinical placement needs in the surrounding region. Offshore medical schools are another competitor, especially in community hospitals, as they offer significant compensation per student placement; UMSOM does not provide compensation to preceptors.

UMSOM reports no plans at present for enrollment increases, due at least in part to the limited availability of training sites. Nationally, medical student training is largely completed in inpatient settings, but some of the newer programs are relying more heavily on longitudinal ambulatory care experiences. While outpatient sites are valued for their training relevance, their broader use is also reflective of the shortage in suitable placements.[38]

In addition to the ongoing challenges of managing such a complex clinical program and availability of training sites, UMSOM's growth is also limited by classroom and laboratory space for lectures, small group seminars, and anatomy and skills labs.

While managing medical students' clinical training requirements is, as respondents reported, "not as easy as it used to be," the system currently is functional. Recommendations for improving processes include the aforementioned streamlining of some of the administrative burden and re-envisioning training roles within clinical facilities. For example, site coordination is frequently an add-on to a faculty member's job and may not receive the optimal time and attention needed. Allocating resources to create educational leadership positions at the clinical facilities would result in a more robust approach to this coordination, with a sharper focus on assessment of training quality and outcomes.

The University of Maryland Emergency Medicine Network has its own unique perspective as it is actively involved in student clinical education. The network provides training opportunities for medical, nurse practitioner, and PA students in seven facilities. Most facilities fall within UMMS: UMMC, UM Upper Chesapeake Health, UM Prince George's Hospital Center, and UM Bowie Health Center. Students are also trained at Mercy Medical Center and Bon Secours Hospital.

Most of the training coordinated by the network is for medical students, and most of that training occurs at UMMC, which accepts 70–80 students annually, three-quarters of whom are from UMSOM. However, UMMC periodically accepts students from up to 23 other medical schools across the country, reflecting the competition for emergency department sites nationwide. Offshore medical schools send students to Bon Secours Hospital (5–8 annually) and UM Prince George's Hospital Center (3–40 annually in 4th year; 15–20 in 3rd year).

The UMMC emergency department (ED) provides the most nurse practitioner placements, with 10–15 placements annually from 4–5 schools, the preponderance coming from the University of Maryland School of Nursing (UMSON). Other EDs accepting a limited number of nurse practitioner students are Mercy Medical Center and Bon Secours Hospital. The network places PA students at Mercy Medical Center (24 annually from the Towson University–Community College of Baltimore County [TU–CCBC] PA program) and UM Upper Chesapeake Health (3–6 annually from the TU–CCBC and the Anne Arundel Community College/UMB [AACC/UMB] PA programs).

EDs are excellent providers of health professional training, even though their unique treatment environment precludes lengthy 1:1 rotations. Despite their busy schedules, EDs offer educational opportunities for students in disciplines outside this report's purview—e.g., EMS, social work, dentistry, and podiatry. EDs see the need to develop more placements within mid-level provider residency programs because of their value within the department, but are constrained in doing so by limited resources. The UM Emergency Medicine Network would welcome additional support for expanding training programs.

NURSING EDUCATION

Within USM, nursing is by far the largest health degree program.[xxxvii] Eight institutions offer nursing at the undergraduate level,[xxxviii] and six institutions offer graduate nursing programs. Nursing education overall is characterized by significant shifts in degree preparation. The desired entry level has rapidly become the baccalaureate degree at a minimum, and there is emergent growth in the master's degree as the point of professional entry, especially for individuals who already have a baccalaureate degree in another discipline. Accompanying these shifts is the educational emphasis for advanced practice nurses (APNs) to be prepared in the doctor of nursing practice program.

In Maryland, nurses who are prepared at the baccalaureate level are in far greater demand than are nurses with an associate degree or diploma. This has led to some growth in baccalaureate program enrollments, as well as a dramatic increase in the availability of degree completion programs. Hospitals working toward magnet recognition from the American Association of Critical-Care Nurses must provide evidence that they are progressing toward (or maintaining) a baccalaureate benchmark—that is, that at least 80 percent of their registered nurses have a baccalaureate or higher degree in nursing.[39]

The Maryland Council of Deans and Directors of Nursing Programs initiated a work group in 2015 to update the Maryland Nursing Articulation Plan and provide for nursing students' seamless progression from an associate degree to a baccalaureate degree.[40] The plan was formally endorsed by MHEC in November 2017. Guided by this document, many USM and private institutions partner with Maryland community colleges to co-administer Associate-to-Bachelor's (ATB) degree programs, in which students are dually enrolled at a two-year and four-year institution and take courses from both institutions simultaneously. These are often concentrated, year-round programs, and students sit for the NCLEX exam and obtain their RN license at the conclusion of the associate degree component. They then go on to finish their coursework and clinical placement requirements as they earn their baccalaureate degrees. Of note in this model is that the bulk of the clinical education requirements are handled through the associate degree program; however, community college-based nursing programs report increasing difficulty in finding adequate clinical sites as they compete with four-year institutions.

Another growing degree completion program is the RN-to-BS/BSN, also offered by many institutions. Practicing RNs enroll in these programs—almost all offered through online delivery—to earn their baccalaureate degree, thereby increasing their employment and professional advancement opportunities. In these programs, additional clinical education is typically limited to one site where community practice and leadership are prioritized.

Pre-licensure nursing students are engaged in clinical placements along with classroom preparation from the very first semester of nursing school. Program directors and clinical coordinators report significant challenges in managing various aspects of the placement process—e.g., location of sites, recruitment of clinical instructors, and coordination of paperwork.

Because of the sheer volume of student placements in nursing and the complex logistics involved in coordinating placements across academic programs and health care institutions, the Maryland Hospital Association partnered with CastleBranch to develop the Bridges program, designed to improve efficiencies in the clinical placement process. Building on what CastleBranch already provides in terms of criminal background checks, drug testing, and immunization records management, the Bridges program schedules two periods annually during which all academic programs electronically submit their requests for student placements. Clinical sites give each nursing

[xxxvii] The Nursing Articulation and Collaboration chapter contains additional information on clinical placements for USM nursing students.
[xxxviii] This number includes UMCP, but at the pre-nursing level only. UMCP pre-nursing students matriculate into the upper division nursing program at UMB.

school a status designation—senior, middle, or low—and placement requests are honored accordingly. Some clinical coordinators describe the process as stressful and frustrating; those schools with senior status more easily place their students, while the remaining schools compete with one another for limited spots. The advantage of the Bridges system is that all requests are centralized, and the clinical sites can rather easily determine whose requests they will honor, creating a more streamlined process for both parties. However, vying for a sufficient number of placement sites continues.

Nowhere is this competition more acute than in obstetrics, pediatrics, and psychiatry. Some academic programs are combining OB and pediatrics in the same rotation, and because of the scarcity of preferred inpatient sites, some are supplementing with large private OB practices, birthing classes, and child care centers. Most clinical courses require 84 clinical hours per student, on average, which are scheduled as 72 hours onsite in the form of six 12-hour clinical days, and one six-hour simulation day (simulation hours are counted as two-for-one). The use of simulation, however, is increasing, commensurate with the shortage in placements, particularly in OB and pediatrics.

The National Council of State Boards of Nursing has offered evidence that nursing education programs can provide well-directed simulation experiences to replace up to 50 percent of traditional clinical placement.[41] Maryland nursing schools currently average 15–20 percent in simulation hours. Community colleges, which continue to produce a significant number of RNs, tend to rely more heavily on simulation, at least in part due to their greater difficulty in securing adequate numbers of placement sites.

Simulation offers a number of advantages: In addition to extending hard-to-schedule clinical experiences, it creates effective avenues for interprofessional education and allows students to continue to apply their knowledge and skills to patient care scenarios without risk to actual patients. However, simulation presents its own challenges in terms of expense, specialized facilities, faculty training, and technical expertise. Costs of high-fidelity manikins and the educational preparation necessary to create scenarios and maintain the equipment can be a significant barrier to simulation use. Access to simulation facilities is uneven, as academic programs report differing abilities to procure the needed technology and run effective simulation programs that meet all of their needs. Expansion of simulation centers and training opportunities is a stated goal of virtually all academic programs.[xxxvix]

In the health care setting, nursing students function in teams of 4–8, under the direction of a clinical instructor. This model is unique to nursing, as academic programs directly employ their own clinical instructors. Overall a well-functioning model, this system is dependent on the health care facility's willingness to accept clinical groups and assign them to units, and necessitates a cap on the number of students in a group. The placement coordinators at the clinical sites work directly with the unit nurse managers, who decide whether their unit can absorb a student group on a specific shift and how many students can be accommodated. Student groups previously composed of eight students are now composed of 4–6—especially on specialized units like pediatrics—which increases the number of clinical sites needed to accommodate all students.

[xxxvix] See the Simulation Facilities chapter for more detail. Sites tend to be much more willing to accept a university's students if their clinical instructors are employees of the site; in fact, many facilities will accept clinical groups only when their clinical instructor is employed there. In most cases, clinical instructors are full-time employees working three 12-hour shifts per week, who pick up a fourth 8–12-hour day as a clinical instructor. The benefit of this arrangement to health care institutions is the clinical instructors' familiarity with their regulations, electronic medical records, and procedures on the units. However, this system makes academic programs dependent on their ability to recruit and maintain adjunct faculty with a less-than-robust payment model. UMMC has created a partner-ship with the pre-licensure nursing program at UMB whereby clinical instructors have the option of either working a fourth day per week as an UMB adjunct faculty member, or substituting a clinical day for a regular work day, thus absorbing their clinical training of students into their regular job responsibilities. This model of institutional support is effective but expensive and uncommon, with the ongoing challenge to schools of locating and training sufficient numbers of clinical instructors.

In addition, all pre-licensure students complete a senior practicum placement, which is conducted in a 1:1 arrangement with an RN preceptor employed by the clinical facility, typically scheduled in nine 12-hour shifts over a semester. This practicum placement can function as a valuable recruitment tool for the facility, but the supervisory needs also contribute to the student training workload assumed by clinical sites.

The responsibilities of academic fieldwork coordinators are extensive, and getting more difficult to manage with the increasing complexities of placements. Fieldwork coordinators assume primary responsibility for maintaining affiliation agreements with each site, most of which—as noted in the Medical Education section—need to be individually negotiated between the school and clinical facility. Coordination with legal counsel is often necessary and time-consuming. Although the use of CastleBranch for records maintenance has helped to standardize the process, fieldwork coordinators report paperwork overload, as they track CPR and HIPAA training, infection control testing, student immunization records, confidentiality statements, computer training, and other facility-specific requirements. The lack of a standardized set of requirements, coupled with the use of dozens of different sites, contributes to this workload.

Fieldwork coordinators are also responsible for orienting and mentoring new clinical instructors, troubleshooting problems with students while on placement, and tracking and analyzing student and clinical instructor evaluations. Because students complete many different placements across multiple agencies, the process of orienting, mentoring, and tracking needs to be repeated numerous times for each student.

APN and DNP programs are growing both in number and enrollment, which creates additional demands for clinical education. These students are required to complete a minimum of 1,000 clinical hours, of which approximately 850 are spent in direct patient care, all on a 1:1 basis with an APN preceptor. Depending on the specialization, students will work with 1–3 preceptors during a semester to obtain their needed experiences. The greatest number of USM's DNP students are enrolled at UMB, and many of them are placed across UMMS facilities. Other DNP students are enrolled at Coppin State University and Salisbury University.

In fall 2018, Frostburg State University will admit its first cohort of DNP students into two programs: Psychiatric and Mental Health Nurse Practitioner and Family Nurse Practitioner. The professional community in Western Maryland lobbied for the development of these programs as a way to increase rural service accessibility, yet it anticipates difficulty in securing students adequate clinical placements. (Frostburg competes for sites with schools from Pennsylvania and West Virginia.) Therefore, program enrollment will be dictated by site availability.

Maryland nursing programs report challenges to growth—growth that is essential to meeting the state's workforce needs—with access to clinical sites regularly cited as the most significant constraint. However, space constraints are also a factor during the didactic educational component, with inadequacy reported in classroom sizes and in lab and specialized training spaces.

Equally significant is the shortage of qualified faculty, especially among nurses who are doctorally prepared and who are interested in academic careers.[xl] As a profession, nursing education receives significant support from the Health Services Cost Review Commission (HSCRC) through NSPII,[42] which awards competitive dollars each year to programs that innovate how they strengthen faculty development and improve educational outcomes. While these resources have helped create several models effective in addressing specific educational needs, ongoing issues remain in nursing education, chief among them the availability and affordability of high-quality clinical training.

[xl] See the Nursing and Articulation and Collaboration chapter for recommendations on this topic.

PHYSICIAN ASSISTANT EDUCATION

USM currently hosts two physician assistant programs, each a collaboration between a System institution and an area community college. The Towson University–Community College of Baltimore County program is a 26-month program that prepares students to earn a master's degree in Physician Assistant Studies from Towson University and a certificate in Physician Assistant Studies from CCBC–Essex. The Anne Arundel Community College/UMB program is a 25-month program awarding a certificate in Physician Assistant Studies from AACC and a master's degree in Health Science from UMB. In both programs, students are dually enrolled and taking classes at both institutions throughout the program. A third USM program in Physician Assistant Studies is being developed at Frostburg State University and will begin admitting students in fall 2018.

TU–CCBC admits 36 students annually and AACC/UMB admits 50 students annually into programs that are largely didactic in the first year and largely clinical in the second year. All students complete nine clinical rotations (or clerkships) in their second year; they spend roughly five weeks each in family practice, internal medicine, emergency medicine, pediatrics, surgery, OB/GYN/women's health, community medicine, psychiatry, and an elective. Students also complete a briefer rotation in their first year prior to full-time placements, during which they focus on strengthening their skills in history-taking and physical exams.

Like many other health professions, the most difficult placements to find are in pediatrics, OB/women's health, and (occasionally) surgery. PA clinical coordinators make certain that students have sufficient opportunities to achieve required learning outcomes as dictated by the profession's accrediting body, but also report creative strategies for finding the appropriate experiences. For example, students may see pediatric and/or gynecological patients in family or community medicine practices, and psychiatric patients in emergency departments.

Beyond specific practice areas, locating a sufficient number of clinical sites for Year 1 placements and for early rotations in Year 2 is particularly challenging, as students are perceived to be less competent and confident earlier in their training and, therefore, to require more time and effort. The AACC/UMB program in particular has attempted to address this through careful composition of clinical groups during the clerkship year and a thoughtful progression of clerkship experiences that build on one another. The TU–CCBC program has identified a number of sites and preceptors who are willing to work with the beginning clinical student, yet it continues to be challenged in finding sufficient numbers of appropriate placements in the early rotations.

PA programs report major competition for clinical sites from medical students and from for-profit PA programs that compensate preceptors or sites for clinical training. At present, both USM programs are committed to non-payment for clinical education, and express concerns about the effect of payment on student diversity, student debt load, and students' willingness to enter primary care as a preferred practice area. However, both programs note that they have either lost access to a few sites, or are in danger of losing access, as the compensation and competition trends continue. Several clinical sites that have been loyal to USM's PA students indicate that their institutions—given pressures on productivity and efficiency—are focused increasingly on return on investment. They caution that student education is frequently treated as a "value-added" calculation, and that academic programs need to pay close attention to ensuring benefits for clinical preceptors and sites. The topic of preceptor incentives is a common one among clinical coordinators locally and nationally.

Complicating the picture for PA clinical training is maintaining the quality of the experiences, which requires ongoing oversight to provide mentoring for preceptors and support for accurate assessment of student performance. PA program faculty report that preceptors are sometimes lax in their evaluations of students and fail to hold them to appropriate standards, creating a "disconnect" between academic training and clinical

practice. The problem is twofold: 1) Students are not consistently held accountable; and 2) preceptors lack uniform training about reasonable expectations. Because preceptors experience burnout and pressure from institutional productivity demands, the USM programs are deliberative in their scheduling requests in an effort to alternate sites and preceptors as much as possible. To be sure, both PA programs report mostly excellent rotations and preceptors who are committed to student training and to "giving back" to their profession. The sites where these relationships are the strongest and of the longest duration are the sites where communication and collaboration have been prioritized.

The PA programs report some initial successes in developing preferential, mutually beneficial relationships with a few clinical sites. The AACC/UMB program, for example, has begun placing students in "longitudinal" sites that accept a certain number of students for all of their required rotations. Onboarding at the site is vastly simplified, orientation to hospital policies and electronic health records happens only once, students and preceptors have more opportunities to evaluate the long-term fit of the placement, and sites are beginning to report success in recruiting these students into employment.

Similarly, the TU–CCBC program has established relationships with a couple of facilities that prioritize their students; the sites are expanding these opportunities to a wider range of practice areas and to a greater number of students in each. In these instances, the programs' clinical coordinators work closely with a facility counterpart who recruits and mentors new preceptors and who collaborates with the coordinators to identify and resolve issues stemming from student performance and from facility need. Both PA programs indicate strong interest in finding new and expanded opportunities to develop committed site relationships as an effective way to address placement needs.

Like many health professions, PA educators are looking to increase high-fidelity simulation as a valuable learning tool for students and as a way to augment specific clinical exposures. Access to simulation centers and to trained simulation technicians is a significant issue, however, and is rated highly as a currently unmet need.

The programs also would like additional resources for preceptor development and training as a means to raise the quality of the clinical experience for both student and provider and to serve as a pipeline for future faculty development. While preceptor orientation happens routinely at the individual site level, schools would like to explore models that could be scaled up for larger audiences, and where attendance may be incentivized by CME credit, tax credit allowances, certifications, etc. Training workshops may be tied to other professional meetings in order to encourage attendance, and topics should include strategies to address efficiency and productivity, including the use of innovative training models that expand beyond the traditional 1:1 placements.

The PA profession continues to grow, primarily through record numbers of new programs in recent years. Growth in the field is linked to identified workforce shortages among mid-level providers. However, existing programs compete for sites with developing programs and would be challenged to expand due to difficulties in finding, developing, and maintaining adequate numbers of high-quality field placements.

PHARMACY EDUCATION

Three academic programs in Maryland serve pharmacy education: Two are part of USM, with programs at the University of Maryland School of Pharmacy (UMSOP) and UMES; one private program is located at Notre Dame of Maryland University.

UMSOP admits 160 post-baccalaureate students annually into a four-year, year-round program, where the fourth year is spent in full-time advanced practice clinical rotations. Each UMSOP student participates in 10

unique clinical/professional experiences throughout his or her education. In all, the program is responsible for 1,600 student placements each year. Students complete three introductory rotations, five advanced practice rotations, and two elective rotations. The first rotation is a 40-hour, primarily observational experience occurring the summer after the first year, in either a community or a hospital location. The next two rotations occur after the second year and during the third year, with three weeks spent in a hospital setting and four weeks spent in a community setting. The advanced practice rotations occurring in the final year are each five weeks in length, and are scheduled in health systems, community, acute, ambulatory care, and patient care elective settings. The elective rotations can occur at any time during the fourth year, and students may select patient care settings, such as pediatrics, cardiology, or emergency medicine; or non-patient care settings, such as the FDA, CDC, or NIH.

The UMES pharmacy program is three years in length, but follows a similar structure to UMSOP's. The 60 post-baccalaureate students admitted each year complete 12 rotations. The first year contains two three-week rotations, the second year contains two longitudinal rotations, and the third year contains eight five-week rotations.

Finding clinical rotation spots is most difficult in hospital, acute care, and ambulatory care settings. Community practice sites are much more plentiful, particularly because of relationships with Walgreens, Target, and other pharmacy practices within large chain stores. Placing students in the advanced practice rotations is easier than in the introductory rotations, as clinical preceptors prefer the longer rotation cycles and the more experienced students.

Pharmacy schools traditionally compensate preceptors for clinical education in the required rotations. This is a longstanding practice in the field, and compensation amounts vary based on the type and length of the rotation. Hard-to-find rotations receive higher honoraria, with a maximum of $325 in the five-week hospital sites. Students' costs for clinical education could approach $3,000 during their enrollment. Funding for preceptor compensation is budgeted from tuition dollars plus an added student rotation fee. In some cases, preceptors accept honoraria directly, but in many sites, including in hospital systems, the compensation is received by the institution and placed in general funds, or used for resources to support preceptors, such as travel and conference registration. A few clinical sites choose to donate the compensation received.

Unlike many other health professions, pharmacy schools have little trouble attracting and retaining clinical preceptors, with the possible exception of targeted clinical areas. The UMSOP program has relationships with nearly 1,000 preceptors, a necessary amount given the high annual volume of placement needs. The UMES program is smaller, but also has numerous established preceptor relationships, primarily on Maryland's Eastern Shore.

Pharmacy preceptors go through an appointment process, submitting materials via an online system, which are reviewed quarterly. The preceptors are then mapped to a specific course. All receive a clinical faculty appointment and have the opportunity to progress in rank—to clinical associate professor and clinical full professor. Preceptors tend to be willing to work with students for a variety of reasons (other than the perks of rank and honoraria): Many are alumni who enjoy giving back to their school and their profession, and many note that they enjoy teaching and find students to be helpful, even in extending the preceptor's own work.

Although preceptor numbers in general may be sufficient, the program still struggles with ambulatory care and hospital placements, as fewer pharmacists are working in these areas. Most students are placed in a 1:1 model with clinical preceptors, but the program allows 2:1 placements in the advanced practice rotations, and 3:1 placements in the introductory rotations.

The size of both USM pharmacy programs is stable and not expected to grow, and pharmacy as a profession is not currently experiencing workforce shortages. Most graduates of the USM programs are Maryland residents and plan to stay in the state to practice. Roughly 80 percent have found a job by their graduation date.

About 25–35 percent of students complete residency training after graduation, an optional two-year program with placements in sites across the country. The residency program allows students to specialize in their second year of practice—in such areas as critical care, cardiology, pediatrics, and gerontology—following a first year in general pharmacy practice. Residency programs are accredited and rigorous, and allow pharmacists to serve more complex patients than are commonly seen in community practice. The benefits of residency programs for pharmacists and consumers notwithstanding, residency programs may detract from the number of placements available to pre-licensure students.

Issues related to adequacy of clinical placements in pharmacy are less acute than in other disciplines facing serious shortages, yet challenges to the provision of clinical education persist. Availability issues are concentrated in the sufficiency of high-quality placements in health system and ambulatory care sites. The UMSOP program describes an "abundance in community sites and a scarcity in health system sites." Competition from other pharmacy programs for hard-to-find placements is an ongoing concern. In addition, programs have limited access to sites in private physician practices and interprofessional clinic settings because of the dearth of pharmacists practicing in those settings. Students would benefit from participating in an interdisciplinary approach with complicated medical cases, where a pharmacy referral to manage complex health issues could result in improved outcomes.

Clinical site availability in selected areas draws considerable attention from the academic programs, as do issues surrounding administration of clinical placements. This administration is a significant responsibility; reviewing credentials, assigning students, preparing honoraria, training preceptors, and assessing performance require a considerable amount of time and skill. (A similar set of responsibilities accompanies the management of affiliation agreements with each facility.)

The time devoted to clinical placements is multiplied by the fact that each student must be scheduled in 10–12 placements over the course of his or her training. This requires considerable coordination, planning, flexibility, and attention to detail. Site visits and attending to students who experience problems while on placement are individualized and time-consuming tasks. The pharmacy programs are therefore interested in streamlined processes that would allow them to focus less on paperwork and more on direct student needs.

REHABILITATION SERVICES EDUCATION

The rehabilitation disciplines discussed in this section are audiology, occupational therapy, physical therapy, and speech-language pathology. Academic programs are available at four institutions within USM. Towson University offers audiology, speech-language pathology, and occupational therapy; UMCP offers speech-language pathology and audiology; UMES offers physical therapy; and UMB (through UMSOM) offers physical therapy. All programs are offered at the graduate level as mandated by their respective accrediting bodies. Physical therapists and audiologists enter practice with a clinical doctorate—the DPT and AuD, respectively—and speech-language pathologists enter with an MS degree. Occupational therapists may enter practice with an MS or OTD degree; however, the OTD will be required for entry in 2021.

Towson and UMCP operate their own onsite speech and audiology centers, which provide diagnostic and intervention services to a range of community members and function as a primary training location for speech-language pathology and audiology students. This decreases their reliance on external fieldwork partners; nonetheless, all students complete external placements, and programs still experience considerable challenges in finding sufficient numbers of high-quality clinical sites.

For speech-language pathology, adult placements are the hardest to find, particularly in inpatient rehabilitation and subacute settings, reportedly due to concerns about decreased supervisor productivity. Sites report that clinicians must maintain a schedule of 80 percent billable hours, which they find very difficult to meet when they must also attend to students' needs. Issues of productivity expectations are raised across all professions; however, some evidence contradicts the assumption that student supervision inhibits productivity.[43]

All rehabilitation disciplines report that they work with sites on a combination of strategies designed to make student supervision more manageable. While most placements favor a 1:1 model, some sites have replaced a portion of their supervision with 1:2 models, a collaborative approach that allows two supervisors to share responsibility for a student, thereby lessening the workload. Occupational therapy notes that this happens most frequently in community-based mental health settings, and they advocate this model when attempting to procure sites, as they describe mental health as their most challenging placement area to secure.

A few sites have had success with a 2:1 model, in which they expect students to be more autonomous and assign them responsibility for working together. Other sites will accept only those students who are further into their training, as they perceive them to be more independent. For example, inpatient medical-surgical units at UMMC will not accept students in their first rotation because of patient acuity, so schools must plan accordingly. In contrast, a fewer number of other sites feel unable to accommodate a full 12-week (or longer) placement, and will therefore accept only introductory students who are onsite for one week or less.

These placement negotiations are representative of one aspect of the academic fieldwork coordinator's responsibilities, and speak to the complexities of their work. Unlike medicine and some nursing programs with more reliable clinical partners, the rehabilitation disciplines compete with each other for clinical spots, especially in hard-to-place areas. They report constant changes and cancellations in clinical placements—even with reservations made 1–2 years in advance—due to shifting staffing patterns and, occasionally, staff interest. Two coordinators described their practice of keeping track of specific practitioners when they migrate to new employers, as their placement success often depends on the person as much as the site.

Contract negotiations for rehabilitation sites are a major responsibility, consuming ever greater amounts of time due to increased legal scrutiny of fieldwork agreements. As state entities, USM universities frequently encounter clinical site resistance to specific provisions of liability insurance coverage and indemnification language, which delays the approval process. Towson reports recent success with signing a multi-institutional and multi-disciplinary agreement with UMMS, representing several of their academic programs—extending even beyond the rehabilitation disciplines. However, the more common practice persists: individual agreements for each health care institution and each discipline, even when contained within the same school.

Towson's occupational therapy program is the only one in Maryland, and the two physical therapy programs (at UMES and UMB) are located far apart geographically. However, all indicate clinical site competition from out-of-state programs, especially those in private institutions that may be able to offer compensation. Because of the limited number of in-state sites, one of the three 13-week clinical placements completed by UMB physical therapy students is required to be scheduled out of state. Occupational therapy also relies on out-of-state clinical sites to meet their placement needs, as does audiology, particularly for their fourth-year externship requirements. All report more contract negotiation difficulty with out-of-state sites, and more challenges in meeting their accreditation standards for site visits and oversight. When asked about their ability to increase enrollment in their programs, all of the rehabilitation disciplines cite clinical placement availability as a major obstacle.

All students in audiology, occupational therapy, physical therapy, and speech-language pathology have clinical training requirements in pediatrics. While a good portion of this training occurs in health care settings, of equal importance is regular, predictable access to schools and other community-based sites. Programs place students in public schools, independent schools, private practices, and nonprofit organizations, with the greatest accommodation in the counties' public school systems. However, programs report ongoing difficulties with these site placements for a variety of reasons—particularly in terms of developing new relationships—which can, in turn, stress their reliance on hospital-based settings. (Some nursing programs similarly report challenges with the availability of public schools, a common placement site used for community health.)

As with most health care fields, incentives for fieldwork supervision is an issue receiving substantial attention. Towson's audiology and speech-language pathology programs pay external sites a small stipend for supervision, roughly $240 per student per placement, but these are currently the only rehabilitation programs compensating sites for clinical supervision.

Occupational and physical therapy programs stopped using a couple of sites when they adopted a compensation requirement, but a few of the larger and more preferred sites do require a return on investment. Johns Hopkins Rehabilitation and UMMS Rehabilitation Network are the best examples, both of which stress a value exchange system that details the services and/or benefits expected to accrue to the clinical sites. Academic programs may be asked to provide lectures and workshops to facility staff; assist with literature reviews; work with facility staff on research projects and co-present with them at conferences; and assign student projects—e.g., evidence-based practice investigations—that dovetail with the facility's interests.

These value-added activities are understandable, but academic programs find their current level of resources overstretched in accommodating these additional expectations. Many other sites respond to more modest acknowledgements, such as preceptor recognition events, awarding of CEUs, access to university library resources, and adjunct faculty appointments. Despite clinical sites' interest in these latter two incentives, some schools report persistent difficulty in procuring library access and faculty recognition for clinical partners.

The greatest need expressed by academic fieldwork coordinators is for a structured, reliable, and streamlined system for student placements. Efficiencies in this area would allow them to focus on other important tasks related to improving supervisor training and mentoring, increasing site visits to troubleshoot potential problems and build relationships, and developing more competency-based standards.

Recognizing the impracticality of a state-centralized system (because of the out-of-state requests received by their clinical partners), academic programs advocate for stronger and more predictable commitments from their most heavily used placement sites. This commitment needs to be supported by the leadership of the health care partners, as individual clinicians are often accountable to policies and expectations beyond their control.

PAYMENT FOR CLINICAL PLACEMENTS

The issue of payment to preceptors or clinical sites is receiving substantial attention.[xli] Survey responses displayed in Tables C–13 and C–14 illustrate the fairly limited practice to date in Maryland; however, this varies by discipline. Thirty percent of respondents reported that they currently provide financial compensation for clinical education; these were concentrated in the rehabilitation disciplines and pharmacy. When asked to identify the top three incentives considered most effective to secure clinical spots, 26 percent identified financial compensation, the second "most effective" strategy after continuing education opportunities. Regardless of current status, most respondents agree that this issue is looming—and growing more urgent.

The majority of academic institutions in Maryland oppose payment for clinical education on philosophical and practical grounds. In most public institutions, clinical payment is achieved by passing the costs onto students, typically in the form of added fees, increased or differential tuition, or a direct pass-through. Only one academic program reported that existing budget funds were reallocated for this expense, and a student fee was added as well. Given the already high costs of health professions education, educators worry that additional expense would limit access to this education for a substantial number of students, and harm efforts to create a diverse health care workforce that is representative of the populations it serves.

One academic dean noted that while many health organizations discuss the importance of diversity, they do not practice it in terms of equal opportunity for student placement. This particularly affects public institutions that may attract a more diverse student population but have no financial ability to offer compensation to clinical sites other than through increased costs to students. A concern commonly stated is that health professions education may become unaffordable for many, and/or create a significant debt load for students. In some cases, the high cost of education could be disproportionate to earnings potential.

In Maryland's public institutions, the clinical site expectation for "sharing" of tuition revenue is made more difficult because there are no more state dollars to allocate to this need. One program noted that academic medical centers have fees associated with them through HSCRC, but that insurance adjustments are designed only to address the expense of medical education. Medical school training is unquestionably essential and expensive, thereby justifying the need for HSCRC support. Yet the same accommodation for other health professions training—most notably nursing, due to sheer volume—has not occurred or occurred at a far lower level.

In addition, academic institutions report that some clinical sites perceive cost-sharing through a different conceptual lens, believing that schools may have excess profit and a positive revenue margin, when in reality, USM institutions operate within a not-for-profit model. Academic institutions report that tuition dollars collected for clinical education are funneled into myriad expenses, including clinical instructors, academic fieldwork coordinator oversight, data management, administration, and equipment. Two academic programs, representing speech-language pathology and audiology, noted that the administrative paperwork needed for disbursement of stipends to clinical supervisors was itself difficult to manage and time-consuming. Of course, health care institutions, too, are mindful of the significant costs they absorb in providing clinical education. Costs begin accumulating prior to and at the outset of clinical training, incurred through administrative expenses, and continue accruing throughout the training period. Clinical site survey respondents reported a substantial investment of time and personnel in fieldwork agreement execution and maintenance, coordination and scheduling efforts, and onboarding processes. Once students are assigned to preceptors, the issues shift to concerns over productivity expectations.

[xli] See the Nursing Articulation and Collaboration chapter for a discussion of this topic.

In some facilities, preceptors may be given fewer patients or may receive virtual relative value unit (RVU) relief, although one respondent described that model as too expensive when costed out. Another noted that practice managers may discourage physicians from accepting students because of productivity targets; if the RVU baseline is not met, physician salaries could be affected.

However, contrasting attitudes toward payment persist. Some teaching hospitals value student clinical training as part of their teaching mission and consider additional payment for salaried employees to be unethical. Others respect their teaching responsibility, yet use their other guiding mission—excellent patient care—to favor more growth in post-licensure residencies. While they still provide clinical education, their commitment to the pre-licensure student is diminished as they prioritize those students who can practice with reduced supervision and provide billable care more independently.

Academic programs are feeling increasing pressure from for-profit and out-of-state schools when attempting to secure placements. Medical schools in the Caribbean, for instance, pay an average of $400 per student per week. One community hospital reported hosting 42 offshore medical students in a year, 21 each in medicine and surgery, resulting in roughly $1 million in revenue. Many teaching hospitals will not accept students from offshore schools, so students are more likely placed in community hospitals, which has the advantage of creating teaching opportunities for community hospital employees, but also the disadvantage of limiting the number of students placed from non-compensating U.S. schools.

Physician assistant programs are especially susceptible to the compensation problem. PA students may have either physicians or PAs as preceptors; facilities might prefer placing medical students under their physicians' supervision, rather than PA students, because of the associated income. Additionally, PA programs are among the disciplines experiencing competition from out-of-state schools. One program director noted that private institutions in Pennsylvania, Virginia, and West Virginia are sending their students into Maryland and paying sites for the placements. A facility-based clinical coordinator reported that her hospital had received five requests to accept out-of-state PA students within the past several months, each offering $275–$350 per student per week. Granted, many sites prefer students from Maryland programs because of the recruitment potential; however, these five requests were for students from Maryland who were studying out of state. That is, they were likely to return to Maryland to practice.

The PA profession has experienced exponential growth in new programs over the past decade, and all students require the same number of clinical placements. The result is a shrinking pool of placement opportunities, increased competition for sites, and increased pressure on local academic programs to start considering ways to provide compensation if demand outpaces supply.

STRATEGIES TO ACCOMMODATE CLINICAL EDUCATION NEEDS

Many academic programs and clinical sites surveyed described creative arrangements they have undertaken to realize efficiencies in processes or value in outcomes. Several examples are recounted here, representing successes that contribute to greater satisfaction with the partnership arrangement. Some may be replicated, adapted, or scaled for more widespread implementation, with the ultimate goal of improving the clinical experience for the student, site, and school.

NURSING

UMMC Student Nurse Resident Program

UMMC initiated a pilot Student Nurse Resident (SNR) program in 2007. Designed largely as an experience to build confidence and skills in student nurses, the hospital considers it an effective tool for recruitment and retention as well: 80–84 percent of SNR program graduates accept their first position at UMMC.

The program does not directly address issues related to the shortage of required placements because it is a voluntary learning experience; however, it takes place in the summer and therefore does not compete for nursing student placements that typically occur during the regular academic year. Quite competitive, the program interviewed 175 applicants in 2018 and accepted 55. Funded through an HSCRC grant and available only to Maryland residents, the program is a full-time, 10-week paid internship and includes both an educational and experiential component. More detail follows:

a. Students are paired 1:1 with a preceptor for patient care on most UMMC units and also attend mandatory education days with heavy simulation use. They are responsible for journaling and a project presentation.

b. Students build competencies and familiarity with a unit, which could be the same unit on which they will be placed for their regular student rotations and senior practica. This familiarity can decrease orientation time for subsequent training as well as for potential new employment.

c. Preceptors are nurses with some experience who are paid to participate in four preceptor classes and to mentor the students who accompany them throughout their work schedule.

d. As currently staffed and funded, the SNR program is unable to accommodate additional growth, primarily due to the limited number of available preceptors. (*NOTE: UMMC hires and orients approximately 300 new nurses annually, many starting in the summer, each of whom is paired with an experienced preceptor. Available preceptors are deployed to new hires, SNR students, and senior practicum students.*)

e. If funded, program expansion into other hospitals could better prepare nursing graduates statewide for optimal entry into practice.

UMMC Clinical Scholar Scholarship Program

All pre-licensure nursing students participate in a semester-long senior practicum—conducted in a 1:1 model with a preceptor—to complete their education. UMMC offers a Clinical Scholars program, building on the senior practicum and adding $5,000 in tuition assistance and a two-year post-graduation work commitment. Designed to attract strong students who will complete their practica on their eventual units of hire, the program provides an effective bridge between education and practice while also streamlining the new employee orientation process and contributing to improved retention rates.

This program has a neutral effect on the number of available placement sites, as the hospital is already providing senior practicum experiences. Of the roughly 125 senior practicum sites offered in 2018, 50 of them came through the competitive Clinical Scholars program. Most Clinical Scholars are from UMSON; next year, the program will be opened to students from Towson University and Stevenson University.

Nursing at UMMC absorbs the cost of the program into its budget, and reports difficulty growing the program because of its expense. Other hospitals offer similar programs on a smaller scale, with expense, again, a factor in program size. However, ongoing cost-benefit analyses may yield evidence of a tradeoff between student training expenses and savings on new employee orientation.

Towson University Collaborative Partnership Program (CaPP)

Towson University is entering its second year of a five-year MHEC-funded NSPII grant. Through partnerships with five hospitals, the program places annual cohorts of 35–37 students into a 10-week paid internship, which occurs in the summer between the students' junior and senior years. The internship supplements the required clinical training students receive and provides a valuable starting point into a continuum of patient care experiences, serving as a bridge to their other requirements. The program is intended to increase clinical experience so that graduating students quickly transition into skilled nurses as they enter practice. More detail follows:

a. Following the summer internship, students continue to work in a paid part-time position on the same unit or in the float pool of the partnership site. During students' final semester, they complete their unpaid 120-hour senior practicum, which, again, takes place on the same unit where they spent the previous summer and fall.

b. Upon successful completion of the NCLEX, students begin orientation for a 2–3 year employment commitment on the unit where they interned.

c. Although periods of nursing shortages may diminish the number of students willing to commit to lengthy subsequent employment, the model is likely to help address needs in desirable practice areas. Additional training may provide a competitive edge in, for example, labor and delivery, emergency department, pediatrics, and ICU.

d. CaPP is designed to rigorously evaluate the model's outcomes so that it can be modified as needed and replicated. In addition to measuring program completion rates and NCLEX pass rates, evaluators assess satisfaction of students, preceptors, new graduates, and nurse managers, as well as retention.

Preceptor Benefit Package

Frostburg State University is launching two nurse practitioner programs in fall 2018, in response to requests from local providers and the need for better access to mid-level providers in Western Maryland. Anticipating problems in finding sufficient high-quality placement sites and committed to avoiding a preceptor compensation model, the program is exploring a variety of options to attract potential preceptors.

Program leadership has consulted with local NPs in the development of an incentive package and has actively included the NPs in the proposal planning process. The proposed strategies are not unique, but the program's approach to preceptor buy-in at the *planning* stage in order to secure commitments prior to implementation may yield promising results. This planning may inform a broader proposal: *to standardize and make available a uniform package of incentives across all USM schools.* More detail follows:

a. The package will include typical professional benefits, such as CEUs, access to current evidence-based practice information, an invitation to participate on the advisory board, and opportunities to engage students in preceptors' professional development activities.

b. A strong relationship to Frostburg will be stressed; the proposal includes the provision of a Frostburg email address and access to the university's databases and library resources.

c. Because of the rural nature of the region, the benefit package may include social activities, such as networking events, raffles for professional conference registration, and thank-you gift bags.

d. The NP program is using Project Concert, a data management software program to which preceptors would be given access. The software incorporates an individual tracking tool to organize and simplify record-keeping.

PHYSICIAN ASSISTANT

Dedicated Student Fieldwork Coordinator

Academic medical centers and large hospitals typically have a clinical education office and staff who handle many of the responsibilities related to student placements. Organizational styles vary, and the most effective arrangements from the standpoint of academic institutions are those that avoid a fragmented approach to scheduling, contract approvals, and other tasks. Smaller institutions may not be well resourced and may assign clinical education responsibilities as an add-on to patient care duties.

With collaboration from the TU–CCBC PA program, one smaller hospital created and funded a full-time staff line to coordinate all student placements. The fieldwork coordinator takes on multiple functions, which eases all of the related processes. More detail follows:

a. The fieldwork coordinator handles all placement requests for APN and PA students, creating schedules several months in advance. TU–CCBC PA students are prioritized.

b. Oversight for all administrative paperwork—e.g., fieldwork agreements and student documents, such as criminal background checks, CPR certification, drug screens, and insurance coverage—is handled by the coordinator.

c. The fieldwork coordinator recruits, trains, and supports preceptors; acts as a liaison between the preceptor and the school in responding to issues; and is able to be onsite when issues arise, especially for preceptor assistance. Similarly, the coordinator establishes individual relationships with interning students, functioning as an internal resource person as needed.

d. The fieldwork coordinator establishes an ongoing and collaborative relationship with the school, and can provide flexibility on an as-needed basis. The relationship is strengthened by the fieldwork coordinator's attendance at monthly program faculty meetings and program events.

e. A major benefit of the arrangement is the coordinator's ability to advocate for and develop new training sites within the facility and its affiliate medical groups, with the goal of creating rotation plans that allow selected students to complete several placements within the facility.

Team Staffing Model

PAs at one facility are organized into zones, and 6–7 may be scheduled each shift. PAs lead many of the zones, and they move around within the zone as needed for patient coverage. The team model allows more students to be assigned to the shift, as they may be paired with different PAs for specific experiences, thereby allowing for shared responsibility.

Each student is assigned to a primary preceptor, but the fieldwork coordinator rotates PA students to different team members by creating a 60-day schedule illustrating the student-preceptor pair each day for labs and other tasks. A reporting form allows team members to provide feedback on the student to the primary preceptor.

Dedicated Relationships

The AACC/UMB PA program has established a formal relationship with one health system and is actively establishing a second, which will effectively place a number of PA students within the two systems for all of their clinical rotations.

Supported and facilitated by leadership at both the academic and the health care institutions, the agreement accomplishes several goals. From the schools' perspective, it provides confirmed training sites for a student cohort and opportunities for students to gain comfort in clinical practice and excel at it, while deepening the connection with that specific professional community. The partnership might also lead to other areas of collaboration.

From the hospitals' perspective, the relationship decreases onboarding expenses and orientation time for incoming students, and is an effective vehicle for employee recruitment and retention, given that the hospitals may hire affiliating students. Key to the model's success is substantial planning and up-front relationship building, which establishes mutual expectations and a vehicle for ongoing communication and evaluation of results.

REHABILITATION

UM Rehabilitation Network Value and Efficiency Strategies

The University of Maryland Rehabilitation Network (UMRN) is working to balance its strong commitment to student training with the demands of patient care and the realities of its workload expectations. With administrative pressures to decrease student volume and an expectation that "there is no forgiveness in productivity standards," UMRN is deliberately and thoughtfully approaching student clinical education with a range of strategies to increase the value of training to the sites and to improve efficiencies. More detail follows:

a. Each site has a center coordinator for clinical education who schedules all student placements for that facility and works with each academic program. In turn, the site requires that each academic program identify a contact person who can coordinate all documentation and logistical planning. UMRN asks the sites to complete paperwork that describes a plan for generating return on investment and adding value as a fieldwork partner.

b. UMRN has simplified the time-consuming fieldwork agreement negotiation process. It has developed one agreement in use for all rehabilitation disciplines from all schools in all the UMMS sites.

c. UMRN values student diversity and chooses to partner with a range of programs it considers to have strong curricula and students well prepared to serve their patient populations. However, UMRN has also reduced the overall number of schools with which it affiliates, preferring Maryland academic programs to out-of-state programs and prioritizing students from USM institutions.

d. UMRN evaluates what academic programs can offer in return, recognizing staff's different needs and interests based on the specific facility. In addition to the traditional and preferred perks offered by the schools—preceptor training, adjunct/affiliate faculty status, and CEUs—UMRN staff are particularly interested in securing student and faculty contributions to research activities and literature reviews, assistance with data analysis, co-presentations, and co-authorships. Acceptance of placement requests is driven by an assessment of the value received in return.

e. Senior students are preferred, as their skills are more developed. Part-time placements are discouraged.

f. UMRN reports requests for student placements from all rehabilitation disciplines well beyond placement capacity. The most challenging request to fulfill is acute care placements for physical therapy students. In order to accommodate as many students as possible and to decrease preceptor workload, many students are now scheduled in a 2:1 model. Following initial staff hesitation, most preceptors report success and satisfaction with managing two students. The pairings are made using several strategies; for example, students from different schools may be paired on some units, and students may be scheduled simultaneously so that orientation and training can occur together. Some pairings are staggered by a month to provide some 1:1 time for each student and opportunities for students to train each other.

g. All preceptors are encouraged to accept students after a minimum of one year of experience, and the system's educational mission is stressed as part of the hiring process. Preceptors are required to attend a training program prior to working with students, and UMRN schedules its own one-day annual training event. It has also partnered with the UMES physical therapy program to develop and offer a CEU-eligible training program, which is hosted onsite and through Blackboard. Student supervision can be rewarded through the performance evaluation process and through promotions up the clinical ladder.

Johns Hopkins Hospital Value-Based Exchanges

Johns Hopkins Hospital (JHH) is a popular site for clinical education in the rehabilitation disciplines for local academic institutions, and is regularly sought out by institutions all over the country and world. New employee recruitment, an attractive incentive to many facilities for providing clinical education, is not a high priority for JHH; the Rehabilitation Services division estimates it hires no more than 8 percent of affiliating students. It also looks to assemble the strongest team possible for its medically complex patients by prioritizing therapists with previous work experience and by reviewing applications from institutions nationally and internationally.

However, JHH asserts its deep commitment to student clinical training as part of the institution's dual mission with patient care, and offers its rehabilitation training program through a lens of value exchanges. More detail follows:

a. JHH's rehabilitation training program is delivered with the goal of increasing efficiency and effectiveness. The hospital projects a training expense of $5,000–$8,000 per student per placement. It recoups a portion of that cost by charging academic programs $100 per student per week of training. Although the hospital reports having lost some schools due to the internship charge, it reports no shortage of private academic institutions willing to compensate for the training. For example, the rehabilitation director reported receiving 145 requests for 20 physical therapy slots in the past year, most from schools offering compensation.

b. JHH offers an alternative to direct compensation for student training, which is a set of activities or services provided by the academic institution and agreed upon by the two partners. It developed a Clinical Education Value Exchange application form for use with its partners; the form describes the desired benefit: "We are looking for exchange of educational resources that are impactful and equivalent to the value that is spent by our personnel for each clinical affiliation slot." JHH has deliberately reduced—to 6–7 per discipline—the number of schools from which it accepts students, as it manages a value exchange program with each.

c. JHH's rehabilitation program is willing to negotiate individual arrangements per school and actively seeks creative agreements that build on the strengths of the partners. Highly valued is access to certificate programs; the rehabilitation director described a certificate in vestibular training and another in hand therapy, both of which are university-based training programs offered to staff at no charge. Other sought-after services include assistance with research activities and with quality improvement and professional development projects—e.g., CEU-bearing advanced skills courses.

d. JHH rehabilitation is also emphasizing administrative internships for students in addition to clinical internships, which may occur as part of an academic program's value exchange agreement. Students are engaged in needs assessments, data analysis, financial planning, program development, and projects linking patients across the continuum of care. Students may complete the administrative internship by staying in the rotation for several additional weeks at the conclusion of their clinical placement, or they may work 80 percent in patient care and 20 percent in administration while on an extended placement, or they may be scheduled at JHH solely for the administrative experience.

e. JHH Rehabilitation Services is keenly interested in growing the number of post-licensure occupational therapy and physical therapy students trained through residencies and fellowships. The preferred model is used by speech-language pathology (SLP), whose students complete a clinical fellowship year (CFY) at the end of their training. CFY is a distinct licensure category under which SLPs who are working under the license of a certified speech-language pathologist can work somewhat independently and bill for their patient-related services. JHH would like to see the occupational therapy and physical therapy academic programs work with state licensure boards and national associations to restructure the educational model in favor of post-licensure residencies and fellowships. A few occur now on a voluntary basis.

PHARMACY

Pharmacy students are scheduled in one facility for 4–5 required rotations. Students apply and are selected for the clinical track program; approximately 40 students are selected each year. Most track systems are developed by hospitals, but a few are community-based clinical tracks.

Pharmacy is attempting to extend this program to additional facilities. Despite a concern about less varied training experiences for students, this option is favorable to both students and sites because of the extensive experience gained within one health system, as well as the opportunity to learn related administrative processes, making orientation to new practice areas easier. Clinical track placements are also good for students who want a residency, as most track sites offer it.

RECOMMENDATIONS

Clinical placements enable academic programs to complete their students' education through essential hands-on practice, and well-trained graduates become the incoming employees that health care institutions need to best serve their patients and communities. To a large degree, academic programs and health care institutions have developed very effective working relationships in terms of providing clinical education. Each describes the partnership as mutually beneficial and interdependent.

However, this partnership between academia and practice—while necessary and valued—is strained by the demands of placement and training, and the challenges facing the partners are universal in some ways and discipline-specific in others. Identifying and supporting key functions can strengthen outcomes that are in the best interests of the partnering organizations, their students, and of course, the patients they serve. Following is a summary of challenges, as well as opportunities for improvement.

ALLEVIATE PLACEMENT SHORTAGES IN CRITICAL PRACTICE AREAS

Numerous professions have identified difficulties in securing sufficient sites for specific practice areas unique to their disciplines. Placements are most difficult to secure in pediatrics, obstetrics and women's health, and psychiatry/mental health. Programs also report obstacles to interprofessional education, which is required by accrediting bodies and essential for optimal team-based practice.

1. USM should increase simulation use to supplement training, particularly in specialty areas.[xlii]
    - Develop or make available simulation centers that are easily accessible to multiple academic institutions and multiple disciplinary programs.
    - Support and/or expand existing academic simulation centers to accommodate greater numbers of students, and students from different academic programs.
    - Increase access to and coordination with hospital-based simulation centers for interning students.
    - Use enhanced simulation activities to promote interprofessional education.
    - Provide financial support for highly trained simulation managers, instructors, and technicians, and approve new faculty or staff lines dedicated to simulation.
2. USM should initiate outreach to all hospitals, outpatient facilities, and private practices associated with UMMS health systems to encourage acceptance of student interns, especially in identified shortage areas. Explore incentives to enhance the cost/benefit calculation.
    - Use UMMC Midtown Campus for a range of disciplinary placements when the hospital is ready to accept students.
    - Expand into all parts of the state, including UM Shore Regional Health and UM Capital Region Health.
3. USM should explore more placements in community-based and ambulatory care settings.
4. USM should encourage use of night and weekend shifts for hard-to-find placements.
5. USM should investigate telehealth and other remote delivery to expand clinical training opportunities, especially for post-licensure students.
6. USM should support exploration of competency-based training models that may shorten mandatory training times.
7. USM should increase use of alternative student placement models to creatively expand the number of students accommodated.

[xlii] This recommendation complements those made in the Simulation Facilities chapter.

ENHANCE PRECEPTOR PRODUCTIVITY AND MITIGATE BURNOUT

Virtually all survey respondents and individuals interviewed—from academic and health care institutions alike—noted the benefits of a strong partner relationship to students' clinical education, yet virtually all also noted the challenging impact on preceptors and supervisors. More than three-quarters of academic fieldwork educators cited difficulty in recruiting preceptors and placement sites. The corresponding issue of decreased productivity and burnout were among the top challenges noted by health care institutions.

1. USM should lay in resources to support expanding incentives that will add value to student supervision, and remove institutional barriers to the provision of desired incentives.
    - For individual preceptors, consider a range of benefits, including affiliate faculty status, adjunct faculty appointment, business cards, library access, library and/or software subscriptions, a university email address, access to athletic and arts events, and formal recognitions and awards. Faculty status and other benefits could be university-specific or Systemwide.
    - For preceptors and clinical units, consider a range of value-added activities that enhance the tangible benefits of student supervision, including assistance with research projects and data analysis, guest lectures, professional development opportunities, and continuing education.
    - Develop a menu of standardized incentives available to all preceptors of USM students.
2. USM should assemble resources for preceptor development, mentoring, and ongoing training and support.
    - Expand existing discipline-specific and/or facility-specific training and certification models.
    - Develop models and/or resources for preceptor management and make them available to all USM academic programs.
3. USM should establish a task force—with representation from academic and health care institutions—to evaluate and disseminate effective strategies for student supervision and workload management.

IN POLICY AND PRACTICE, ADDRESS FINANCIAL COMPENSATION FOR CLINICAL EDUCATION

The survey of academic programs reveals that while USM's disinclination to compensate clinical partners is not currently a significant impediment to clinical site availability, it is nonetheless a growing concern, given local and national trends. Out-of-state schools offering payment are readily approved for in-state clinical placements, as are private schools that pay for student training. This puts USM students at a competitive disadvantage when vying for placements.

1. USM should commit UMMS member hospitals to give priority placement to students from System institutions without the expectation of financial compensation.
2. USM should encourage physician practices within the UMMS Physician Network to provide uncompensated clinical training to System students.
3. USM should expand use of non-monetary incentives for clinical partners that provide mutually beneficial value.

4. USM should initiate contingency planning for compensation on an as-needed basis.
    - Consider compensation for critical practice areas.
    - Initiate an approval process for additional student fee and/or differential tuition models.
    - Explore all funding models and sources to limit the financial burden on students.
    - Create an interprofessional task force to investigate successful practices in other regions.

STREAMLINE ADMINISTRATIVE AND LOGISTICAL RESPONSIBILITIES

All parties involved in student placements express concerns about increasing workloads and paperwork burden. Student scheduling, contract approval, onboarding processes, and intake and assessment forms comprise an ever-growing amount of coordination and effort. Nearly half of the preceptors and three-quarters of the schools surveyed noted significant challenges related to documentation requirements and administrative workload.

1. USM should collaborate in developing standard multidisciplinary fieldwork and multi-institutional agreements, including an umbrella agreement in effect for all UMMS facilities.
    - Draft common language to address frequently occurring issues—e.g., extent of liability insurance coverage, limits of indemnification as state agencies.
    - Access legal counsel at each institution that has expertise in and often handles fieldwork agreements.
    - Develop a communication network of general counsel offices in academic and health care settings to anticipate issues affecting execution of fieldwork agreements. Explore a statewide agreement acceptable to all academic and health care institutions, with possible coordination by USM and/or the Maryland Hospital Association, applicable to both USM and non-USM institutions.
2. USM should establish uniform paperwork requirements that can be accepted across academic institutions and clinical facilities and that would stay in effect throughout the duration of a student's training if consistently enrolled in the academic program. This would minimize duplication of effort while reducing students' out-of-pocket expenses for such activities as criminal background checks, drug screens, and CPR training.
3. USM should expand access to, support for, and use of electronic databases for document storage, update, and retrieval, and explore commercial products for purchase, implementation, and training.

ESTABLISH DEDICATED RELATIONSHIPS AND SYSTEMS THAT YIELD PREDICTABLE PLACEMENT SITES

Most academic programs have an expectation of student placements at their commonly used clinical sites, and yet they still report no guaranteed or consistently predictable pattern. Many academic clinical coordinators describe the constant requesting of sites for each rotation as one of the most frustrating and time-consuming parts of their job, particularly when they have to deal, as well, with last-minute cancellations. Medicine and nursing are the best organized disciplines in this regard, through a well-staffed office in UMSOM and use of the CastleBranch nursing placement system, respectively.

1. USM should explore a reservation system for specific disciplines that can provide greater predictability in site availability by placement area—e.g., mental health, internal medicine.

2. USM should develop preferential relationships, where feasible, that help streamline the placement process by establishing standard expectations.

3. USM should encourage the creation of innovative partnerships whereby health care institutions identify a clinical coordinator to act as a liaison to specific educational programs. The coordinator's role would include locating placement spots, mentoring preceptors and providing for their ongoing professional development, troubleshooting issues among students and preceptors, and coordinating administrative requirements.

IMPROVE COORDINATION ACROSS SYSTEMS AND INSTITUTIONS

Health care education and delivery are inextricably linked; you cannot have one without the other, and both share a fundamental goal: ensuring the provision of high-quality health care for individuals, families, and communities. However, each responds to its own set of constraints and regulations from external bodies in ways that shape its operations, often with incomplete knowledge of the influences on the other's practice. The growing impact of technology on health care innovation extends to the educational arena, whether teaching students through simulation or preparing them to use bedside clinical technologies.[44] Limited understanding of how education and delivery operate within their respective environmental, technological, and regulatory landscapes can preclude effective collaboration.

1. USM should disseminate widely to all stakeholders the results of regular systematic reviews of Maryland workforce needs.

2. USM should conduct environmental scans and workforce trend analyses to identify hot spots that can forecast supply and demand by discipline, practice area, and geographic region.

3. USM should monitor the growth in NP and PA utilization, including increased expansion to non-hospital settings, with clear targets for meeting clinical training needs. USM should encourage sites' acceptance of APN students beyond their own employees.

4. USM should establish an academic and service delivery joint planning process to anticipate system changes and opportunities, including the growing effect of technology on education and service delivery.

ENHANCE CURRICULAR COLLABORATION BETWEEN ACADEMIC INSTITUTIONS AND HEALTH CARE SITES

Nearly one-third of academic programs involve preceptors in curricular planning, but 95 percent of surveyed preceptors indicate they want to be involved. Discussions with academic and clinical respondents suggest missed opportunities for communication to clarify expectations. Academic coordinators do not want to overburden preceptors, but many preceptors would welcome invitations to provide input into student learning outcomes, especially with regard to the knowledge and skills needed for that critical period of transitioning into practice.

1. USM should explore preferred structures for increasing the amount of regular communication and coordination between academic programs and commonly used clinical sites with respect to academic content and student competencies.
    - Use existing advisory boards and/or regional fieldwork councils to convey essential information and to brainstorm desired outcomes.
    - Form a representative task force to develop a set of objectives and a blueprint for achievement, focusing on graduating students' successful transition to entry-level practice.
    - Emphasize eliminating any "disconnect" between learning outcomes as practiced in the academic setting vs. the clinical setting.
2. USM should focus on the correlation between the final semester of study and the period of entry into practice to ensure that students acquire and use essential entry skills for the clinical environment.
    - Review new hires' orientation and training curricula to assess the possibility of incorporating selected content into the culminating portion of the academic curricula, which would achieve more immediate efficiencies in the workplace.
    - Undertake inclusive review and planning with multiple clinical sites, recognizing the different competencies expected by different employers—e.g., large teaching hospitals vs. community hospitals.
    - Encourage clinical personnel and hospital-based educators to actively participate in the planning and delivery of end-of-program academic coursework, seminars, panels, etc.
    - Consider a jointly designed skills checklist to ensure preparedness for entry into practice.
3. USM should support more transparency and collaboration between two-year and four-year institutions so that two-year students are advised correctly and achieve greatest efficiency in meeting prerequisite requirements. This model is most well developed in nursing and can be expanded to other disciplines.
4. USM should increase communication and collaboration—especially regarding advisement and eligibility—between professional programs and the baccalaureate programs that commonly serve as their feeders.

CREATIVELY SUPPORT RESIDENCY PROGRAM GROWTH

Post-licensure residencies are gaining in popularity, particularly among nurses, and many hospitals are actively developing residency programs. Pharmacy residencies are also common, and residencies are slowly being developed in rehabilitation services. Although residencies provide a valuable bridge in skill development and are associated with improved employee retention, the demand for residency programs outstrips the supply.

1. USM should support growth in residency program availability through a range of creative funding sources, including state dollars and training grants.

2. USM should explore the expansion of residency programs in non-hospital placements—e.g., primary care, long-term care, rehabilitation. Successful models, such as the Rutgers Out-of-Hospital Nurse Residency Program, create opportunities for expanded partnerships between academic and practice settings and increase the availability of competent practitioners across the health care spectrum.[45]

3. USM should monitor discussions at the national level regarding changes to health professions' accreditation and education to track potential movement from a primary focus on pre-licensure clinical training to post-licensure clinical training.

UNDERTAKE A COMPREHENSIVE ASSESSMENT OF CLINICAL EDUCATION

The need for clinical education is well established in producing competent practitioners to deliver high-quality health care. However, rigorous and objective measurement of the true costs and outcomes of this education is elusive and methodologically difficult.[46] Health care organizations are struggling with a transition to value-based care delivery, heightened in part by the Medicare Access and CHIP Reauthorization Act of 2017, which prioritizes measurement of patient outcomes and care quality.[47] That focus on return on investment for all care-related expenses (as they impinge on outcomes) extends to resources used for clinical training.

While the health care industry adapts to the realities of value-based payments, the educational complex is debating how to respond to its own needed changes and move closer to "competency-based, time-variable health professions education," transforming the organization of clinical education in true collaboration with health care providers. A report from a 2017 Macy Foundation conference lays out a blueprint for such an evolution.[48] While not yet occurring in Maryland, all of the health professions educational associations are exploring movement in this direction, and innovation is expected to follow.

Developing data-driven evaluation of clinical education costs, benefits, learning outcomes, and impact on the Quadruple Aim[49] could help guide future discussions about the most effective partnerships between schools and clinical sites.

1. USM should explore assessment metrics that measure value (cost of care, patient/student/preceptor satisfaction, and clinical outcomes) to examine the impact of students' education in the clinical setting.

2. USM should develop a plan and manageable process for analyzing costs associated with health care employee recruitment, orientation and training, and retention, as compared with upfront clinical training costs.

3. USM should review tools to assess student outcomes in the clinical setting, as aligned to the needs of the health care system as well as to the required disciplinary competencies.

4. USM should consider a broad approach to cost and benefit measurement—including non-monetary factors that inform the value equation—in order to shape a robust and ongoing conversation about mutual benefits.

SIMULATION FACILITIES

Simulation provides a critical learning environment for students, allowing them to integrate theory with practice, while making real-time clinical decisions in a safe environment.

Of all the facility-related constrictions experienced across USM's health professions programs, an insufficiency of simulation facilities is the most consequential.

MEMBERS

Robert Joyner (chair)	Associate Dean, Henson School of Science & Technology Special Assistant to the Provost for Health Affairs *Salisbury University*
Karen Olmstead (chair)	Interim Provost and Senior Vice President for Academic Affairs *Salisbury University*
Katherine Cvach	Regional Manager, Professional Nursing Practice *University of Maryland Shore Regional Health*
Kathryn Montgomery	Chair, Partnerships, Professional Education & Practice *University of Maryland School of Nursing*
Marlene Riley	Clinical Associate Professor, Occupational Therapy & Occupational Science *Towson University*
Denyce Watties-Daniels	Director, Simulation and Learning Resource Centers *Coppin State University*

Also Contributing

Amy Daniels	Director, Debra L. Spunt Clinical Simulation Lab *University of Maryland School of Nursing*
Mary Pat Ulicny	Clinical Simulation Lab Director *University of Maryland School of Nursing*

Health care providers must be adept at responding quickly and appropriately to all clinical care scenarios, both predictable and unpredictable. Given significant technological advancements, simulation training provides an excellent learning environment for students, who need safe, low-risk opportunities to interact with "patients." While hands-on learning with *real* patients cannot be completely replaced, simulation training can augment (and in some cases substitute for) authentic clinical experiences, allowing students to make mistakes—and to learn from them—which is a valuable part of their development as health care professionals. Simulation serves as a critical bridge between the classroom and the clinical experience.

Using results of a survey completed by nine USM health programs—regarding their current use of simulation, the training and resources dedicated to it, and the barriers they encounter to high-quality simulation training—we recommend the following actions:

1. Establish a Center of Excellence in Simulation Education to support Systemwide coordination of simulation training and increase USM universities' access to resources.
2. Develop a mobile simulation resource for USM institutions and their clinical partners.
3. Significantly expand existing simulation facilities in three sites that will most effectively serve educators and students across USM.

SIMULATION AND HEALTH PROFESSIONS EDUCATION

Simulation, as defined by the Association of American Medical Colleges, is "the method used in health care education to replace or amplify real patient experiences with scenarios designed to replicate real health encounters, using lifelike mannequins, physical models, standardized patients, or computers."[50] Simulation, in its many forms, has been used in medical education since the time of antiquity, when models of human patients were built in clay and stone to demonstrate clinical features of diseases and their effects on humans.[51]

Simulation training is standard practice in the military, aviation, nuclear, and space industries. Simulation has emerged as an important part of education in industries that find training in a real-world environment simply too costly, too dangerous, or both. In risky situations, high-quality simulation training is often credited with good outcomes, and its lack is found complicit in poor outcomes. Indeed, such incidents as the Apollo 13 space mission, the Three Mile Island nuclear reactor meltdown, and the water landing of Flight 1549 ("Miracle on the Hudson") are frequently forwarded as justifications for training that enhances an individual's performance in stressful environments.

Providing medical care is an inherently risky act. In fact, it has been determined that medical errors cause more than 400,000 deaths each year in the U.S. and harm an additional 3.5 million people.[52] This makes medical error the country's third-leading cause of death after heart disease and cancer. It is no longer a question of why simulation should be used in health care education, but why it has taken so long to be incorporated.

Three serendipitous events from the 1940s through the 1980s caused the use of simulation in health care education to blossom. The first was Åsmund Laerdal's development of Resusci-Anne, allowing widespread use of a low-cost manikin to teach rescue breathing and chest compressions to the masses for the first time.[53] Second was a single human simulator, "Sim One," developed by Abrahamson and Denson in the late 1960s. It was the first manikin with sophisticated physiological features and responses (e.g., palpable pulses and blood pressure).[54] The third event was the nearly simultaneous, but independent, production of two unique high-fidelity environments—that is, simulation that attempts to mimic the actual working environment as closely as possible. The goal of both simulation models was to develop a methodical approach to team-based training that would carry over into patient care and improve outcomes in high-risk settings like the operating room. A team at Stanford University developed the comprehensive anesthesia simulation environment (CASE),[55] and a team at the University of Florida developed the Gainesville anesthesia simulator (GAS).[56] These simulation platforms have evolved over the years and, in their current form, are still used by many hospitals, educational institutions, and the military.

Technological sophistication was not the only reason simulation began to be incorporated into health care education; there, too, was a growing appreciation that new practitioners are not prepared to provide care independently upon graduation.[57] This recognition resulted in the rise of simulation training both in academic institutions (with students enrolled in health care programs) and in health care settings (with newly graduated health care professionals). As simulation is associated with faster, more in-depth learning, and with reducing mistakes that increase morbidity in patients, it has been suggested that using a well-developed curriculum involving simulation is an ethical imperative in health care education today.[58] Additionally, as simulation training is being used in two distinct ways—to prepare students for their individual health professions and, increasingly, to prepare the interprofessional health care team—it becomes especially appropriate to consider simulation capabilities within USM.

In 2015, the National League of Nursing (NLN) published a vision statement regarding the use of simulation in nursing education, which is broadly applicable across other health education fields. In this report, the NLN noted, "Simulation provides a rich learning environment … to integrate theory with practice while making real-time clinical decisions in an environment that poses no risk to patients."[59] The NLN so strongly supports the effectiveness and transformative nature of this evidence-based pedagogy that it endorsed the substitution of simulation for up to 50 percent of traditional clinical experiences. (See also recommendations by the National Council of State Boards of Nursing.[60])

Indeed, the expert use of simulation provides an effective and efficient strategy to mitigate a common impediment in health care education: limited clinical placements for students.[xliii] The substitution of required clinical hours is not yet permissible in the training of respiratory therapists, physical therapists, medical laboratory scientists, or physician assistants, but can be used in pharmacy programs.[xliv] Also of note is the opportunity for simulation centers to provide a venue for interprofessional education activities, as pre-licensure students or even practicing professionals can engage in any number of scenarios.[xlv]

[xliii] See the Clinical Partnerships and Placements chapter for more information.

[xliv] For Pharmacy, 60 hours may be substituted for 300 pharmacist/patient care situations. Accreditation Standards and Key Elements for the Professional Program in Pharmacy Leading to the Doctor of Pharmacy Degree; page 9. Accreditation Council for Pharmacy Education. Feb. 2015.

[xlv] See the Interprofessional Education chapter for more information.

SIMULATION USE WITHIN USM

Of USM's 14 institutions and regional centers, eight currently use simulation in the curriculum (Table S–1). There exists within USM a variety of academic programs using simulation; it is most commonly used in programs educating physicians, nurses, nurse practitioners, nurse anesthetists, pharmacists, physician assistants, respiratory therapists, physical therapists, dentists, and occupational therapists.

Table S–1. USM Institutions and Use of Simulation Resources

Institution	Simulation Resources
Bowie State University	Yes
Coppin State University	Yes
Salisbury University	Yes
Towson University	Yes
University of Maryland, Baltimore	Yes
University of Maryland, Baltimore County	Yes
Frostburg State University	No
University of Baltimore	No
University of Maryland, College Park	No
University of Maryland Eastern Shore	No
University of Maryland University College	No
University of Maryland Center for Environmental Science	No
Regional Higher Education Center	
Universities at Shady Grove	Yes
University System of Maryland at Hagerstown	Yes

The Maryland Clinical Simulation Resource Consortium is a statewide funding initiative supported through NSPII and approved by the Maryland Health Services Cost Review Commission. The consortium promotes the use of simulation in nursing education in Maryland, establishes simulation quality guidelines that advance patient safety, and provides resources to maintain simulation equipment specifically for nursing programs.

Improving the quality and increasing the quantity of simulation in nursing education is an important starting point in assuring simulation sufficiency in Maryland, as nursing is fundamentally important to all aspects of patient care. And yet nursing is still a single component of the health care team. It is well recognized that interprofessional collaboration among *all* members of the health care team is associated with improving patient outcomes.[61]

Indeed, the Centers for Medicare & Medicaid Services has taken steps to encourage providers to create interprofessional care teams.[62] The center's Accountable Care Organizations were formed to "ensure that patients, especially the chronically ill, get the right care at the right time, while avoiding unnecessary duplication of services and preventing medical errors."[63] It is only through cooperative and efficient delivery and monitoring of care by all providers that resources for that care can be saved.[64] The future of health care does seem to reside with the expert *team*.

BARRIERS TO SIMULATION EDUCATION

Simulation use in health professions education is an expensive undertaking, and a realization of improved outcomes must accompany its considerable costs. Otherwise, the expense is likely to discourage adoption among those charged with distributing limited resources. Additionally, without our commitment to expanding the evidence base for simulation, the practice will retain a peripheral place in health care training, and its use may stagnate.

USM, with its many and diverse health care programs, is well positioned to develop interdisciplinary research initiatives that would clarify where simulation is best deployed. These initiatives could provide evidence not only of where simulation training is most useful, but also where it is *least* useful, allowing USM to assume a leadership role in the appropriate—and fiscally judicious—administration of this expensive tool for the training of individual professionals as well as the interprofessional team.

Five barriers impeding the use of simulation have been identified.

CURRICULUM

Anesthesiology offers a robust model for adopting simulation training in a deliberate effort to improve patient care. The Stanford University team that developed the CASE simulation environment in the 1980s later designed the anesthesia crisis resource management (ACRM) curriculum, still considered an important tool for minimizing harm to patients during critical events. The ACRM is shown to improve the performance of the provider team through structured practice and debriefing.[65]

An attempt to develop structured clinical environments is not new to simulation. However, using structured simulated environments to support early development of interdisciplinary teams with non-physician providers is new and provides USM an opportunity to lead in this domain.

PARTICIPANTS

Learning from simulation requires that students be actively engaged in the educational process. They must first suspend disbelief, as there are always aspects of simulation that cannot imitate reality perfectly (e.g., pain, fear, risk of exposure to blood, work of breathing). Dieckmann et al. (2012), identified barriers to participant learning that include issues within the scenario itself and within the debriefing that occurs when the scenario is completed. [66]

Within the scenario, problems identified by the participants included being afraid of embarrassment in front of their peers or instructors; little understanding of the specific purposes and goals of the scenario; and problems with the equipment caused by technical malfunction, lack of availability of specific technology, or insufficient instructor planning and training. Within the debriefing process, problems included a lack of participant engagement during the review; risk of a shame-and-blame environment; lack of structure to the debriefing process; and insufficient time for the debriefing process to be completed.[67]

Each of the issues identified by Dieckmann represents expertise that faculty and institutions must attain to incorporate simulation effectively. Best practice faculty resource models are not available currently and represent an opportunity for USM. Student anxiety, objective building, anticipation of equipment issues, and curricular planning must all be attended to by the faculty member and must therefore be a part of the faculty workload. With the resources available, USM could contribute enormously to shaping best practices on issues of faculty development and workload in simulation delivery.

COST

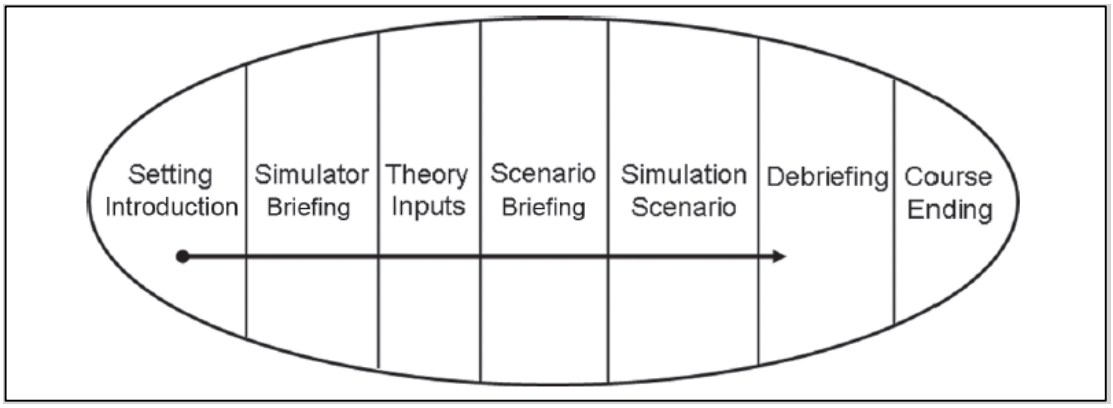
Many of the technologies implemented by simulation educators are expensive. Depending on the fidelity of the simulator, the cost for the equipment alone can exceed $250,000. This cost does not include facilities, faculty time, and faculty training. In 2006, McIntosh et al., in evaluating their own newly developed simulation center, realized a set-up cost of more than $870,000, with an ongoing yearly commitment of $361,425. Assuming the simulation center is in use at least three full days, 52 weeks per year, the breakeven course fee was $311 per hour. As a result, there was an explicit need for resources from commercial interests, which comprised 50 percent of the center's utilization.[68]

When choosing to incorporate a sophisticated curricular technique like simulation into USM programs, critical thought must be given to the type, complexity, and need for such projects, as resources will always be a limiting factor in their sustainability. For some tasks, low-fidelity simulators can match the outcomes of high-fidelity, expensive manikins.[69] Gaining an understanding of the resources already being applied to simulation education at each USM institution is an important first step in developing a sustainable plan for USM. This data could guide development of cost-cognizant best practices for USM institutions.

FACULTY

The cost of training faculty is an important consideration in simulation education, as high-quality faculty training is needed to support positive student outcomes. Simulation does not work without appropriate debriefing.[70] Faculty comfort and effectiveness when directing simulation education depend on intense preparation and support.[71] Dieckmann (2009) has published a model of seven independent factors that encompass a health care simulation exercise from start to finish (Figure S–1). Any generalized incorporation of simulation into the curriculum must involve the factors identified by Dieckmann. This requires significant effort by the faculty member, who must be supported to obtain the expertise to produce a worthy simulation.

Figure S–1. A Model for Components of Simulation Delivery



Source: Dieckmann P, Friis SM, Lippert A, Østergaard D. Goals, success factors, and barriers for simulation-based learning. *Simulation & Gaming* 2012;43(5):627–647.

The University of Washington has developed the Center for Health Sciences Interprofessional Education, Research and Practice.[72] This is a web-based faculty development center with information and courses that faculty can use to become simulation experts. An online effort like this could be enhanced with a bricks-and-mortar resource center, where faculty who have completed distance-based training could practice their simulation skills to gain confidence and new ideas. USM is well suited for this model, as the state is relatively small, enabling faculty to access a centralized location for specialized training tailored to their program needs.

RESEARCH

For health care educators already involved in simulation, the reasons to use the technique are not in need of clarity. However, the critical evidence needed to support simulation—across the health care spectrum and across a university system—is, at best, difficult to find.[73] While a great deal of publication related to simulation is occurring, few of these publications meet the rigor expected of health care-related research, and few incorporate outcomes-based data. As simulation becomes predictably more expensive and the pressure to lower the cost of health care education becomes more commanding, there is a desperate need for high-quality simulation data validating its use.

Contributing to this research base is the National Council of State Boards of Nursing, which recently evaluated the use of simulation as a substitute for traditional clinical experiences in nursing education.[74] The results suggest there were no significant differences in knowledge or clinical performance in students who received some simulation training (up to 50 percent of their clinical hours) as a substitute for traditional clinical experiences. Guidelines[xlvi] produced as a result of this study offer nursing faculty, programs, and schools a blueprint for creating a simulation program that will yield outcomes comparable to the study's.[75]

We have no knowledge of other health care professions having generated similar data or outcomes. This dearth gives USM an opportunity to produce the data needed to validate simulation training and to refine its delivery within various health professions curricula.

[xlvi] The guidelines address simulation training, development, implementation, and evaluation.

RECOMMENDATIONS

After surveying USM institutions regarding simulation use and barriers within their programs, we recommend a three-phase approach to addressing the System's simulation needs and to improving the effectiveness and efficiency of simulation use.

1. Establish a Center of Excellence in Simulation Education to support Systemwide coordination of simulation training, to increase training efficiency, and to open institutions' access to scenarios, assessment, and best practices. *(Phase I)*

2. Develop a mobile simulation resource to deliver multiple simulators to System institutions, hospitals, and their affiliated training sites to maximize availability of these resources. *(Phase 2)*

3. Significantly expand existing simulation facilities in three sites that will most effectively serve the routine needs of health care educators and students across USM: one in Western Maryland; one in Central Maryland; and one on the Eastern Shore. *(Phase 3)*

Together, these three phases should: 1) promote the effective use of simulation education to support student access to a variety of clinical experiences; 2) increase USM's production of health care graduates (given expanded simulation resources); and 3) provide consistent opportunities and budgeting for faculty development, assessment of educational outcomes, maintenance and upgrading of simulation facilities, and access to specialized manikins and other technologies.

Additionally, we recommend that USM fund a meeting of the state's simulation education stakeholders and hire a project consultant and cost estimator to develop a more detailed and comprehensive budget.

As noted, these recommendations are based on the results of a survey distributed to USM health professions programs.[xlvii] That survey was modeled on an instrument used for a similar project in Montana[76] and distributed to the USM programs below. Nine of the 10 programs—as indicated by a check mark—completed the survey.

- ✔ Bowie State/Nursing
- ✔ Coppin State/Nursing
- ✔ Frostburg State/Physician Assistant
- ✔ Frostburg State/Nursing
- ✔ Salisbury University/Sim Center
- ✔ Towson University/Nursing
- ✔ Towson University/Nursing at USMH
- ✔ University of Maryland/Nursing
- ✔ University of Maryland/Nursing at USG
- *UMBC/Emergency Health Services*

[xlvii] In planning the survey, we determined to focus exclusively on pre-licensure programs (excluding medical education).

The survey and results (presented in Appendix S–A) are summarized here. Budgets associated with each of the recommendations may be found in Appendix S–B.

We asked respondents about the availability of specific simulation technologies within their programs, in which areas and for which skills training those technologies are used, and the needs associated with the technologies. Specifically, respondents were asked about the availability and use of standardized patients, task trainers, intermediate-fidelity manikins, high-fidelity manikins, and virtual reality (with and without haptics).

Acknowledging obstacles to adopting or expanding simulation use, respondents indicated that they have limited budgets for the acquisition, replacement, and maintenance of simulators; faculty training and certification; scenario development; debriefing resources; and operations. However, they have strong interest in expanding the use of simulation and in providing faculty more robust professional development in support of this pedagogy.

Responding institutions use their sim facilities to provide realistic simulations that help prepare students to meet the complexity of the health care landscape, and to enhance opportunities for students to develop clinical reasoning skills, to transition into practice, and to learn how to manage common practice issues in a safe and controlled environment. The responding programs use simulation, as well, to stimulate research and scholarship.

Collectively, simulation serves the following programs among responding institutions: Nursing (BS/BSN [traditional and accelerated, RN-to-BSN], MS/MSN, Clinical Nurse Leader, NP, and DNP), Respiratory Therapy, Occupational Therapy, Applied Health Physiology, and Physician Assistant. Respondents indicated that simulation facilities are used for advanced health assessment and diagnostic reasoning, primary care across the lifespan, and women's health, as well as for research projects undertaken by students outside health care majors—e.g., math majors modeling pulmonary dynamics. Respondents also indicated that their facilities are used by both pre- and post-licensure learners.

Just one responding institution is accredited by the Society for Simulation in Healthcare; another has an initial application pending. Five of nine respondents indicated that their sim center staff members have health care simulator educator certification (four of the nine) or are in the process of obtaining it (one of the nine).

Most respondents indicated that the faculty and staff using their facilities have received training. Training sites include the Center for Medical Simulation,[xlviii] Debriefing for Meaningful Learning, Laerdal Simulation Training, Maryland Clinical Simulation Resource Consortium,[xlix] Drexel's Center for Interprofessional Clinical Simulation & Practice,[l] and the NLN's Institute for Simulation Educators.

Asked about the strengths of their simulation centers, respondents cited enthusiastic and knowledgeable faculty; faculty who support the use of simulation and are willing to learn; support from their deans and other administrators; and creative approaches in the use of simulation. However, only two respondents indicated that their equipment and facilities are or will soon be state-of-the-art.

[xlviii] Available at: *https://harvardmedsim.org/*
[xlix] Available at: *https://cms.montgomerycollege.edu/mcsrc/*
[l] Available at: *http://drexel.edu/cnhp/about/cicsp/*

Respondents' primary unmet needs are related to resources—resources to support program evaluation, learning assessment, and research on best practices, as well as operational/annual budgets. This insufficiency, in turn, may result in heavy reliance on external funding for all aspects of sim center operations and may limit leadership, faculty development, and use of new modalities. Strong interest in sharing training resources and expertise was expressed. Other needs include resources for repair and replacement of equipment and associated technical staff (e.g., sim engineer). Additional needs are noted in the survey results (Appendix S–A).

ESTABLISH A CENTER OF EXCELLENCE IN SIMULATION EDUCATION

In Phase I, USM should establish a Center of Excellence in Simulation Education to support Systemwide coordination of simulation education, to increase training efficiency, and to open institutions' access to scenarios, assessment, and best practices.

This USM center would function largely as a virtual center—with many resources available online—but it would also offer regular in-person training for instructors and sim center personnel. Additionally, the center could provide guidance on salaries, position descriptions, and other HR-related issues associated with these types of highly specialized facilities.

The center's activities would focus on faculty, staff, and facility development and would be informed by standards, terminology, and recommended practices of such organizations as the International Nursing Association for Clinical Simulation,[li] the Society for Simulation in Healthcare,[lii] the Center for Medical Simulation, and others. We also recommend close collaboration with the Maryland Clinical Simulation Resource Consortium.

DEVELOP A MOBILE SIMULATION RESOURCE

Once the USM Center of Excellence in Simulation Education has been established and initial online and in-person training resources are available, we recommend in Phase II the development of a mobile simulation resource (Mobile Sim Lab), a model increasingly used in rural areas—e.g., see projects in Nebraska[77] and Montana.[78]

The Mobile Sim Lab would be available to deliver multiple simulators to universities, hospitals, and their affiliated training sites, and would maximize the availability of these resources across USM while reducing the need for existing sim centers to maintain a large inventory of simulators that they use infrequently.

An additional trainer—hired as part of the USM Center of Excellence—would expand the personnel available to support on-site training, deployment of specialized manikins, and other activities. The curriculum, training, and theory-based debriefing supported by the Mobile Sim Lab would be developed in close collaboration with the academic programs and health care organizations being served.

Issues needing to be addressed include whether simulators are used in the Mobile Sim Lab or moved on-site; video-capture for debriefing; climate-controlled storage of simulators not in use; electrical connectivity; and energy efficiency of the vehicle while on the road and when in training use.

[li] Available at: *https://www.inacsl.org/i4a/pages/index.cfm?pageID=1*
[lii] Available at: *http://www.ssih.org/*

EXPAND EXISTING SIMULATION FACILITIES WITHIN USM

We recommend significantly expanding existing simulation facilities in three sites that will most effectively serve the routine needs of health care educators and students across USM:

1. one in Western Maryland—at Frostburg State University or USMH;
2. one in Central Maryland—at USG or UMB; and
3. one on the Eastern Shore—at Salisbury University, which would serve students from Salisbury and from UMES.

Note: One of these expansion sites would already be established as part of Phase 1, the USM Center of Excellence in Simulation Education.

CONVENE THE STATE'S SIMULATION STAKEHOLDERS AND DEVELOP A MORE DETAILED BUDGET FOR SIMULATION EXPANSION

We recommend that USM fund a meeting of the state's simulation education stakeholders—including the Maryland Clinical Simulation Resource Consortium (MCSRC), an NSPII-funded initiative at Montgomery College focusing on nursing education—to share the details of this plan and to gain buy-in. (See Appendix S–C for a list of MCSRC-affiliated programs.)

Additionally, we recommend that USM hire a project consultant and cost estimator to develop a more detailed and comprehensive budget for this three-phase implementation plan. The action group's initial calculations suggest that this plan would require, at a minimum, $860,650 in annual personnel and operating funds and $7.98 million in startup funds, with additional replacement costs on a six-, eight-, or 12-year cycle (see Appendix S–B).

INTERPROFESSIONAL EDUCATION

USM has a diverse mix of high-quality health, allied health, and human services programs.

If these programs are brought together purposefully and collaboratively, they could be an influential force in the development of a forward-looking model for interprofessional health care education.

MEMBERS

Roger Ward (chair)	Senior Vice President, Operations and Institutional Effectiveness Vice Dean, Graduate School *University of Maryland, Baltimore*
Ronnie Allen	Dean, School of Pharmacy and Health Professions *University of Maryland Eastern Shore*
Tony Bibbo	Senior Administrator, Department of Pediatrics *University of Maryland School of Medicine*
Mona Calhoun	Chair, Health Information Management *Coppin State University*
Heather Congdon	Assistant Dean, University of Maryland School of Pharmacy at USG Co-Director, UMB Center for Interprofessional Education *University of Maryland, Baltimore*
Scott Fritz	Associate Dean, Curriculum and Outreach, College of Liberal Arts and Sciences *Frostburg State University*
Lori Harvin	Assistant Professor, Nursing *Coppin State University*
Robert Joyner	Associate Dean, Henson School of Science & Technology Special Assistant to the Provost for Health Affairs *Salisbury University*
David Mallot	Associate Professor, University of Maryland School of Medicine Co-Director, UMB Center for Interprofessional Education *University of Maryland, Baltimore*
Ben Passmore	Assistant Vice Chancellor for Administration and Finance *University System of Maryland*
Lisa Plowfield	Dean, College of Health Professions *Towson University*
Lisa Rickard	Clinical Assistant Professor, Department of Hearing and Speech Sciences *University of Maryland, College Park*
Carrie Wallace	Senior Administrator, Department of Medicine *University of Maryland School of Medicine*

Interprofessional education (IPE) is an "important pedagogical approach for preparing health professions students to provide patient care in a collaborative team environment."[79] The premise of IPE is that health care practitioners trained to work in interdisciplinary teams will improve patient outcomes while reducing health care costs. This promise of efficacy in improving both the quality of care and the efficiency of delivery has proved compelling to accrediting bodies and to health care payers. In fact, a number of influential contemporary forces have converged in a manner not seen before and will likely accelerate and shape the discourse and activity around IPE for decades to come.[80]

Although individual colleges and universities across the country have launched various IPE initiatives, there is no truly coordinated and collaborative university systemwide approach to IPE. Because of its reputation as a national leader in research, teaching, and innovation, USM is well positioned to contribute significantly to the evolving body of knowledge on IPE and to assume a key role in shaping and modeling large-scale IPE practice.

The ideas presented in this chapter are aimed at realizing a threefold vision: 1) Establish Maryland and USM as a national leader in IPE; (2) ensure that our students receive a distinctive educational experience that sets them apart from others educated elsewhere; and (3) provide the citizens of Maryland access to an unmatched level of high-quality care because of our IPE model. We therefore recommend the following:

1. Invest in scaling select IPE activities and programs that exist Systemwide.
2. Invest in ongoing research into the efficacy of IPE as a pedagogical approach and as a means of improving patient outcomes.

A BRIEF HISTORY OF INTERPROFESSIONAL EDUCATION

Interprofessional education is commonly defined as "occasions when two or more professions learn from, with, and about each other to improve collaboration and the quality of care."[81] The topic has been discussed internationally for nearly 50 years. For example, the United Kingdom began development of an interprofessional education model in the early 1960s. By 1970, it was in full bloom in primary and community care centers in the U.K. At the turn of the century, IPE had become mainstream in the U.K. and integrated into most training curricula.

In the early 1970s, IPE began to be discussed in the United States. In 1972, Edmund Pellegrino, chair of an Institute of Medicine (IOM) conference on the "Education of the Health Team," boldly claimed that "a major deterrent to our efforts to fashion health care as efficient, effective, comprehensive, and personalized is our lack of design for the synergistic interrelationship of all who can contribute to the patient's well-being."[82]

However, by the 1980s, very few IPE models had been developed in the U.S. The one exception was in the field of gerontology, which had benefited from federal funding to develop IPE programs. As the funding dried up, however, so did the programs. By the 1990s, driven by medical topics of mutual interest, many small-scale IPE projects developed across the U.S., mostly in the form of interdisciplinary courses. Into the late 1990s and at the turn of the century, the U.S. lagged behind countries such as England and Canada in the full-scale implementation of interprofessional health care education, despite calls from health commissions, government officials, professional organizations, and the World Health Organization to accelerate such efforts.

There is now renewed interest and broader motivation to build team-based health care training in the U.S. In 2003, IOM published a report of a national conference of 150-plus health care leaders convened in 2002. The purpose of the conference was "to discuss and develop strategies for restructuring clinical education across the full continuum of education." The resulting report, *Health Professions Education: A Bridge to Quality*, focused on efforts to improve health care safety and quality by ensuring that health professionals can work in interdisciplinary teams to cooperate, communicate, and integrate care that is continuous and reliable. Moreover, the report laid out a new and comprehensive vision for the education of health professionals: "All health professionals should be educated to deliver patient-centered care as members of interdisciplinary teams, emphasizing evidence-based practice, quality improvement approaches, and informatics."[83]

IPE INITIATIVES AT INSTITUTIONS NATIONWIDE

By the mid-to-late 2000s, a number of U.S universities were attempting to answer the call of the IOM report and develop models for interprofessional health care education. In 2004, Rosalind Franklin University of Medicine and Science designed a one-credit-hour course, "Interprofessional Healthcare Teams." The course was required and comprised a didactic component, a service-learning component, and a clinical component. During the course, all first-year students were grouped into 16-member teams with representation from medicine, clinical laboratory, medical radiation, nurse anesthesia, pathologists' assistants, psychology, and physician assistants.

In 2006, the University of Florida developed an Interdisciplinary Family Health (IFH) course, required for all first-year students in the colleges of medicine, dentistry, pharmacy, nursing, physical therapy, clinical psychology, and public health. This effort was coordinated by the Office of Interprofessional Education, which was charged with facilitating and supporting multiple cross-college curricular developments in addition to the IFH course. By 2010, almost 3,500 students had completed the course, resulting in nearly 8,000 home visits serving more than 500 families in the Gainesville area.

One of the oldest IPE models in the U.S. is at the University of Washington (UW), which is home to six health professions schools: medicine, pharmacy, nursing, social work, public health, and dentistry. The university established the Center for Health Sciences Interprofessional Education in an effort to integrate the teaching, research, and professional activities of these schools. The course catalog at UW includes collaborative interprofessional offerings for students in which they may learn with, from, and about each other—outside of their programs' silos. In addition to the integrated coursework, co-curricular service-learning and experiential training activities are required.

The National Center for Interprofessional Practice and Education at the University of Minnesota is a public-private partnership that provides leadership, evidence, and resources to guide the U.S. in using interprofessional education and collaborative practice as a way to enhance the experience of health care, improve population health, and reduce the overall cost of care. The center aims to do this by aligning IPE and collaborative practice with transforming health care delivery.

In 2014, a survey of members of the Association of Academic Health Centers was conducted to gain a better understanding of the status of IPE integration across the country. Specifically, the survey probed the presence of interprofessional coursework and practice experiences at member institutions, as well as infrastructure around IPE. Responses were received from 68 universities in 31 states and the District of Columbia. Eighty-five percent of respondents reported that they had interprofessional courses in place, and 80 percent of respondents had interprofessional clinical rotations or internships in place.

To better understand the variety and scope of IPE offerings across the U.S., Heather Congdon, associate professor at the University of Maryland School of Pharmacy and co-director of UMB's Center for Interprofessional Education, last year conducted a cross-sectional survey of 30 institutions with an established IPE infrastructure in place. More than 50 percent of responding institutions required a first-year IPE course or experience for students. (With a growing number of health professions schools now mandating or strongly encouraging IPE as a part of the curriculum, the number of institutions with such a requirement will likely increase significantly.) Eighty-seven percent of responding institutions had established an advisory committee or equivalent to review their IPE offerings for quality. Many also had additional working groups within their IPE infrastructure consisting of faculty representing disciplines across their campuses. Involvement of faculty is important to the development, growth, and assessment of IPE in order to implement innovative ideas, represent all disciplines involved, and develop institution-specific best practices for IPE.

Professor Congdon's study revealed that while many of the participating institutions have robust IPE curricular frameworks in place, there is still much work to be done to meet accreditation requirements for health professions disciplines.[84]

TRADITIONAL BARRIERS TO IPE

The challenges universities face in developing interprofessional programs are considerable. The literature is replete with examples, commentaries, and research on the types of barriers that prevent effective interprofessional education. The traditional barriers to IPE described in the literature range from the use of inconsistent language to more significant institutional and structural barriers.

PROFESSIONAL CULTURES

Each profession has evolved over time and developed its own identity, values, scope of practice, and role in patient care. At the conclusion of formal education, students are expected to have mastered the skills and ethics of their profession, enabling them to assume occupational distinctiveness. This process is called "professionalization." A common example involves the values of the physician culture, in which physicians are taught to take charge and assume command in many patient care situations. For physicians, then, learning to cede leadership in an interprofessional team setting may be difficult, as they may be inclined, or be expected by other team members, to take on the leadership role.

Other professions have different value systems that are similarly instilled during the training process, and these professional cultures create communication barriers between the professions. An important goal of IPE is to make professional values apparent to team members during training so as to remove them as obstacles to effective patient care delivery.[liii]

[liii] For more information, see Pecukonis E, Doyle O, Bliss DL. (2008). Reducing barriers to interprofessional training: Promoting interprofessional cultural competence. Journal of Interprofessional Care, 22(4):417–428.

UNIVERSITY EDUCATIONAL SYSTEMS

The majority of American universities have grown to be subdivided into many areas of specialty and organized in multiple school and departmental silos. This naturally contributes to the disintegration of academic knowledge and loss of opportunities for interfacing with other health professions students. It has been documented that even during clinical coursework, students rarely interact collaboratively with health care students in professions other than their own.[liv]

LACK OF RESEARCH IN IPE

The most frequently heard complaint among academics is the lack of IPE outcomes research to justify it as an educational methodology that delivers improvements in the quality of patient care. As interest in IPE increased in the mid-to-late 1980s, a parallel emergence of research suggested that collaborative relationships among health care providers positively affect patient, family, and provider outcomes. Other studies found that collaborative relationships among nurses and physicians were associated with a decrease in mortality in ICU patients. Additional research found positive outcomes in the following areas: emergency department culture; patient satisfaction; collaborative team behavior; reduction of clinical error rates for emergency department teams; management of care delivered to domestic violence victims; and enhanced mental health practitioner competencies related to the delivery of patient care.

There remains, however, a need for ongoing research into the efficacy of IPE as a pedagogical approach and as a means of improving patient outcomes.[lv]

OTHER BARRIERS

Many other barriers to IPE have been discussed anecdotally and in the literature. They include such forces as divergent curricular goals, non-coterminosity of academic and clinical environments, resource constraints, and ownership of clinical and educational resources. The absence of role models, experienced educators, and reimbursement for team-based care have also been cited as barriers. Another challenge implicit in IPE is the notion that time should be made within the curriculum for this type of learning and training. This is generally perceived as a significant logistical barrier given that the cost in real and human resources to adjust the curriculum can be significant, as are the costs for the classroom space, infrastructure, and technology that facilitate IPE.[lvi]

Despite the challenges of developing high-quality interprofessional models, a number of influential and converging forces will likely accelerate activity around IPE.

[liv] For more information, see Bridges DR, Davidson RA, Odegard PS, Maki IV, Tomkowiak J. (2011). Interprofessional collaboration: Three best practice models of interprofessional education. *Medical Education Online*, 16, 6035–DOI 10.2402/meo.v16i0.6035.

[lv] For more information, see Dauphinee D, Martin B. (2000). Breaking down the walls: Thoughts on the scholarship of integration. *Academic Medicine*, 75:881–886.

[lvi] For more information, see: 1. Clark PG (2011). The devil is in the details: The seven deadly sins of organizing and continuing interprofessional education in the US. *Journal of Interprofessional Care*, 25(5):321–327; 2. Angelini DJ. (2011). Interdisciplinary and interprofessional education: What are the key issues and considerations for the future? *Journal of Perinatal and Neonatal Nursing*, 25(2):175–179; and 3. Hall P. (2005, May). Interprofessional teamwork: Professional cultures as barriers. Journal of *Interprofessional Care, Supplement 1*, 188–196.

CONTEMPORARY DRIVERS OF IPE

ACCREDITATION

Academic program accreditation is a major factor in shaping the curriculum in health professions schools. Likewise, accreditation has recently been acknowledged as one of the most significant drivers for curricular change related to IPE. Accrediting bodies continue to refine their standards and incorporate notions of IPE into the educational requirements for the training of health professionals.

Most accrediting bodies have now incorporated, or are planning to incorporate, the language of IPE into their standards. The American Association of Colleges of Nursing, for example, has integrated interprofessional collaboration behavior expectations into their standards.[85] The Association of American Medical Colleges formally identified IPE as an issue of action. Accreditation standards for dental education programs contain language promoting collaboration with other health professionals.[86] Pharmacy accreditation requirements now incorporate consistent language around cooperation in an interprofessional team.[87]

Moreover, the Interprofessional Education Collaborative (IPEC) promotes four Core Competencies for Interprofessional Collaborative Practice that underscore competency expectations for interprofessional education:

1. *Values/Ethics for Interprofessional Practice*. Work with individuals of other professions to maintain a climate of mutual respect and shared values.
2. *Roles/Responsibilities*. Use the knowledge of one's own role and those of other professions to appropriately assess and address the health care needs of patients and to promote and advance the health of populations.
3. *Interprofessional Communication*. Communicate with patients, families, communities, and professionals in health and other fields in a responsive and responsible manner that supports a team approach to the promotion and maintenance of health and the prevention and treatment of disease.
4. *Teams and Teamwork*. Apply relationship-building values and the principles of team dynamics to perform effectively in different team roles to plan, deliver, and evaluate patient/population-centered care and population health programs and policies that are safe, timely, efficient, effective, and equitable.[88]

PATIENT SAFETY AND QUALITY OF CARE

Patient safety and quality of care are significantly influencing U.S. health care reform and health care education agendas. In 2006, a comparison study of domestic and international investigations into patient deaths identified that some health care was far below standard; quality monitoring processes were deficient; individual care providers and patients raised concerns; critics were often ignored or abused; patients and families were not informed members of the team; and teamwork was deficient.

Even though each of these concerns may have implications for IPE, the finding related to deficient teamwork is particularly important. The study concluded that many health care professionals involved in patient care were fundamentally capable and committed but had ineffective working relationships. The emerging standard is for students to gain the knowledge, skills, and attitudes to understand and value the viewpoints and responsibilities of others in order to enhance their collective abilities to provide safe and quality care, together.[89]

ECONOMICS

The Affordable Care Act provides financial incentives for care coordination to provide seamless transition from hospital to home. This system has become known as bundled payment. Under the bundled payment model, reimbursement for multiple providers is lumped into a single, comprehensive payment that covers all of the services involved in a patient's care. Bundled payment aims to control costs, integrate the care delivery systems, and restructure the delivery of care. This type of reimbursement further incentivizes health care professionals to work collaboratively.

In his 2011 report, *Making the Business Case for Interprofessional Education and Training*, Anthony Knettel argues that the economic case for IPE is part of the "causal chain" linked to the business argument for interprofessional collaborative practice, which is, in turn, "integral to the future of health care." He delineates several trends that strengthen the business case for interprofessional practice, including:

1. Government budget constraints creating narrow hospital margins that, in turn, require care delivery in a multiprofessional setting;
2. Aging populations with multiple comorbidities requiring multiprofessional care coordination; and
3. A diminishing tolerance for administrative and human resource costs of poor interprofessional collaboration and its consequences (e.g., disciplinary and legal proceedings, unnecessarily high staff turnover).[90]

In short, to remain cost-competitive, to improve quality in a pay-for-performance reimbursement climate, and to address the health needs of an aging population, health care systems will need to make interprofessional collaborative practice central to the way they organize and deliver care.

ANSWERING THE CALL: A USM IMPERATIVE

USM comprises a diverse and rich mix of member institutions, many of which have outstanding health, allied health, and human services academic programs. These programs, if brought together *purposefully and collaboratively*, can be a potent and influential force in the development of an innovative and forward-looking model for interprofessional health care education. The following are assets that could be critically evaluated as we identify ways to position USM as a national leader in IPE.

EXPAND COLLABORATIVE COURSE AND CLINICAL OFFERINGS AT USG

More than 80 undergraduate and graduate degree programs from nine USM institutions are offered at USG in Montgomery County. The Committee for Interprofessional and Interdisciplinary Education Strategies (CIPES) capitalizes on this colocation of multiple programs and institutions, offering courses, exercises, and projects intended to assure that USG students are able to engage collaboratively with other disciplines and professions and provide high-quality care and service to their client populations.

EXPAND THE USE OF INTERPROFESSIONAL CASE STUDIES

Towson University's College of Health Professions hosts a student case event each year in which 250 students learn the roles and responsibilities of each other's professions as they manage a complex, community-based scenario. Scenarios range from those affecting individuals and families (e.g., family responses to spinal cord injury—from the acute phase to the chronic—and associated community-based wellness needs) to those affecting entire municipalities (e.g., large-scale disaster management). First responder responsibilities, simulation experiences with urgent care, chronic management of sequelae, and the economics of collaborative care are routinely addressed during these exercises. These university-wide events—hosted annually at fellow USM institutions as well—could be adopted by more universities within the System or expanded to include them.

Additionally, Salisbury University and UMES have developed the Eastern Shore Collaborative for Interprofessional Education (ESCIPE). Every undergraduate and graduate health care program at both Salisbury and UMES participates in the collaborative, which facilitates interprofessional, inter-institutional education and academic–practice partnerships among faculty, professionals, and students.

Each year, ESCIPE brings students together for interprofessional activities that cultivate an environment of collaborative practice. These activities include case simulations of interprofessional care for patients with complex pathologies, such as Parkinson's disease, sepsis, and traumatic injury. The case simulations allow students at both institutions to experience interprofessional care that closely mirrors the clinical environment and to better understand the critical role that interprofessional practice plays in optimal patient care. In the past four years, the collaborative has generated three peer-reviewed publications and two national presentations, and its activities could be replicated at other USM institutions.

PROVIDE IPE IN A SIMULATED CLINICAL ENVIRONMENT

Many universities[lvii] have developed and implemented various interprofessional health education models. The overwhelming majority of these models, however, focus primarily on interprofessional course offerings and/or interprofessional clinical experiences in community settings. None of the models seems to focus in a deliberate and comprehensive way on the important "middle ground" between coursework and clinical placement—that is, interprofessional simulation education.[lviii] This apparent oversight may be one of the key reasons why the efficacy of IPE in the clinical setting is still an open question.

An IPE SimClinic would afford faculty, students, and researchers across the spectrum of USM's health and related programs the opportunity to learn, teach, and discover in a sophisticated, controlled environment. The vision for an IPE SimClinic is one that is:

1. Available and readily accessible to all USM institutions;
2. Spacious enough to accommodate multiple groups of students and faculty working on different simulated clinical scenarios;
3. Supported by technology that allows for remote participation by distance learners and faculty, and is equipped with recording and archiving capabilities;

[lvii] E.g., the University of Arizona, Vanderbilt University, the University of Virginia, the University of Washington, the University of Kentucky, and Thomas Jefferson University

[lviii] See the Simulation Facilities chapter for more information.

4. Capable of providing nonintrusive monitoring and observation spaces for evaluators and researchers as well as IPE teaching "laboratories" for faculty; and

5. Instrumental in developing and disseminating sound pedagogical approaches and practices to bolster the quality of simulation education at institutions across USM.

With an IPE simulation clinic, USM could provide students in its health, allied health, and human services professions a unique educational experience that sets them apart from students educated elsewhere, while transforming them into team-competent and practice-ready health care professionals.

CONDUCT IPE EXERCISES USING STANDARDIZED PATIENT FACILITIES

Standardized patient simulation involves the use of individuals trained to portray patients, family members, or others so that students may practice physical examination, history taking, and patient communication, among other exercises. Standardized patients are carefully recruited and trained to take on the characteristics of a real patient, thereby allowing students to learn and to be evaluated in a simulated clinical environment.

Standardized patient IPE exercises are an effective pedagogical tool in preparing students for practice. These exercises, with effective coordination, could be conducted in an interprofessional manner across USM using existing standardized patient facilities.

PROVIDE INTERPROFESSIONAL CLINICAL EXPERIENCES FOR STUDENTS

UMB PRESIDENT'S CLINIC

In cooperation with the University of Maryland School of Medicine and with the support of UMB's Center for Interprofessional Education, UMB President Jay A. Perman, MD, hosts a weekly President's Interprofessional Clinic at the University of Maryland Medical Center pediatric gastroenterology department. Students representing UMB's schools of medicine, dentistry, social work, law, nursing, and pharmacy participate in the clinic each week; they learn with and from each other, engage in problem-solving on behalf of patients and families, and collaborate in care and service delivery.

The clinic also offers a free, non-credit, minimester experience to visitors, faculty, and students interested in IPE. Participants engage in didactic sessions and in clinical interaction with pediatric patients receiving medical care at the clinic and with their families.

To provide more students the opportunity to participate in this interprofessional model, the President's Clinic could leverage the video and audio conferencing capabilities of the Maryland Research and Education Network. With these assets, students in a variety of health and allied health programs at fellow USM institutions would be able to participate from a distance in the clinic.

AHEC CLINICAL SITES

The Area Health Education Center (AHEC) Program is a federally funded initiative intended to improve access to high-quality health care for underserved populations in rural and urban communities and to provide comprehensive education and training for health professions students.

For nearly 30 years, the University of Maryland School of Medicine has directed the Maryland AHEC program, which offers an exceptional venue for improving interprofessional education in a primary care setting. The

Maryland AHEC system consists of two rural centers and one urban center: AHEC West, established in 1978 and located in Cumberland; Eastern Shore AHEC, established in 1995 and located at the Eastern Shore Hospital Center in Cambridge; and Baltimore AHEC, established in 2003 and located at the University of Maryland Medical Center Midtown Campus.

AHEC activities promote multidisciplinary and interdisciplinary education for health professionals and enhance Maryland's existing program of graduate and continuing medical education and health training. USM could leverage Maryland's AHEC model for robust interprofessional training of the health care team—and do so in settings where the need for this training is particularly acute.

GOVERNOR'S WELLMOBILE PROGRAM

The Governor's Wellmobile Program is a community partnership model of mobile nurse-managed primary health care. Run by the University of Maryland School of Nursing, the Wellmobile's mission is twofold: 1) to provide primary and preventive health care to underserved communities and uninsured people across the state; and 2) to serve as a training site to expand student learning opportunities in the care of underserved populations.

The 33-foot vans are each equipped with two exam rooms, an intake/education area, and a clinical laboratory. The Wellmobile's unique capacity to travel to several sites each day maximizes care access for those who need it.

Faculty from UMB's schools of medicine, nursing, pharmacy, and social work collaborate to treat patients in the Wellmobile, and students from each of these schools use it as a clinical learning site. With adequate funding, the Wellmobile could expand its operations and include students and faculty from fellow USM institutions and from additional health and allied health professions.

TOWSON UNIVERSITY INSTITUTE FOR WELL-BEING

Towson University's Institute for Well-Being (IWB) houses four clinics that actively educate students interprofessionally: the Hussman Center for Adults with Autism, the Speech and Language Center, the Hearing and Balance Center, and the Wellness Center. Through the institute, undergraduate and graduate students from the College of Health Professions and from related majors offer services to clients and their families.

Along with faculty clinicians, students work in collaborative, interprofessional dyads and groups to support the health, fitness, and social needs of the community. Students majoring in athletic training, audiology, deaf studies, exercise science, gerontology, health care management, health science, nursing, occupational therapy, and speech-language pathology participate in required and elective collaborative clinical and internship experiences at the IWB.

As funding has allowed, UMB's physical therapy students have joined in an annual interprofessional education day with Towson's occupational therapy and speech-language pathology students. Similar accommodations could be made to include students from other USM institutions.

RECOMMENDATIONS

To guide our recommendations, we developed a survey to inventory IPE activities and assets across USM, and to determine the capabilities and needs of each set of activities along with the resources used for them. (Survey questions and responses appear in Appendix I–A.) The provost at each university served as the action group's point of contact for dissemination of the survey, which 11 of 12 USM institutions—as well as USG—completed.

The inventory was our jumping-off point for discussing which of the existing IPE opportunities and assets can be scaled up to expand IPE effectively, and to develop a detailed budget for scaling up these programs and for promoting and coordinating IPE across USM at various levels of funding.

Following is a summary of the survey's key findings:

- Eight of the 11 responding institutions had adopted the World Health Organization's definition of IPE—i.e., "when students from two or more professions learn about, from, and with each other to enable effective collaboration and improve health outcomes."[91]
- All of the respondents indicated that IPE was either a "high" or "moderate" priority at the institution.
- Respondents identified program accreditation requirements, institutional culture, institutional support, and faculty interest as the most important factors driving their IPE activities.
- Asked to indicate the perceived benefits of IPE, the institutions cited: 1) promoting team-based learning, 2) improving patient outcomes, 3) improving efficiency in patient care, and 4) reducing conflict among health care providers when determining patient treatment plans.
- Among the most significant barriers to implementing IPE, the institutions cited competing priorities for faculty (constraining the time available to participate in IPE), lack of human resources, insufficient common time available among disciplines participating in IPE, and inadequate financial resources.
- At eight of the responding institutions, IPE is required by the institution (or within one of its programs) for graduation; however, only seven indicated that they currently offer IPE experiences to students.
- Key areas of support needed to initiate or improve IPE experiences include financial support, human support, workload accommodations for faculty participating in IPE, release time, and faculty development.

We asked survey respondents to categorize each of the IPE activities at their respective institutions according to a recognized continuum of interprofessional learning: Exposure (novice), Immersion (intermediate), and Competence (advanced).[92]

Exposure is an introductory-level activity that provides students the opportunity to interact with and learn about their peers from other professions. In this stage, students are still learning about their own profession as they begin to grow acquainted with other practitioner roles and scopes.

Immersion is an extended IPE experience that allows students from different professions to learn with, about, and from one another in the context of treating a patient (real or simulated). At this stage, students have a more advanced knowledge of their profession gained through classroom and practice experiences. Through immersion exercises, students learn about the strengths and limitations of their profession, and they challenge their ways of thinking and interacting with others.

At the level of *Competence*, students have achieved the learning outcomes required in the first two domains and demonstrate mastery of the majority of IPE competencies necessary to be high-functioning members of an interdisciplinary health care team.

SCALE EFFECTIVE IPE PROGRAMS SYSTEMWIDE

In evaluating which of the existing IPE activities and assets to recommend for scaling, we took into consideration the distribution of IPE activities and collaborations across all USM institutions and gave priority to the following:

- activities related to high-need areas in Maryland's health professions education;
- activities in which participation can be enhanced or increased by the use of technology; and
- most importantly, activities tailored to optimizing student learning in each of the three IPE domains—exposure, immersion, and competence.

Based on these criteria, we recommend the following IPE activities be scaled to benefit students across USM.

IPE ACTIVITIES: EXPOSURE

Interprofessional Scope-of-Practice Seminar—*Salisbury University*
This scope-of-practice activity facilitates the interaction of students from various disciplines in pre-defined scenarios. The objective is to heighten student awareness of professional scope of practice, improve interdisciplinary communication, and thus support cohesive health care team development.

Scope-of-practice activities include case simulations of interprofessional care for patients with complex pathologies—such as neurodegenerative disorders, traumatic injuries, and chronic diseases—allowing students to experience interprofessional care that closely mirrors the clinical environment and to better understand the critical role that interprofessional practice plays in optimal patient care.

Expanding this effort to include other USM institutions could be straightforwardly accomplished through the use of the established video and audio conferencing capabilities of the Maryland Research and Education Network.

Foundations of Interprofessional Education and Practice—*UMB*
This online module series is an easily accessible way for students to develop foundational knowledge essential for subsequent in-person interprofessional experiences. The series presents six learning modules based on the IPEC Core Competencies for Interprofessional Collaborative Practice[93] and principles of cultural engagement. The modules are: 1) interprofessional collaboration; 2) cultural engagement; 3) values and ethics; 4) roles and responsibilities; 5) interprofessional communication; and 6) teams and teamwork.

NEXUS—*UMBC*
UMBC is one of four institutional partners in NEXUS (National Experiment in Undergraduate Science Education), funded by the Howard Hughes Medical Institute (HHMI). This collaborative project responds to *Scientific Foundations for Future Physicians*,[94] published jointly by HHMI and the Association of American Medical Colleges, which calls for competency-based science education to better prepare students for medical, pharmacy, and veterinary schools and also to better educate students who are studying the basic biological sciences.

The goal of the UMBC NEXUS project has been to develop and disseminate validated competency-based modules and assessment tools that integrate quantitative thinking into the introductory biology topics.

See Appendix I–B for a summary of the budget needed to scale up these Exposure activities, as well as discrete budgets for each activity.

IPE ACTIVITIES: IMMERSION

Friday Night at the ER—*Towson University*
Friday Night at the ER challenges teams to manage patient flow in a busy hospital during a simulated 24-hour period. The exercise illustrates, powerfully and palpably, the imperative for collaborating across boundaries—whether those boundaries are functional, professional, jurisdictional, or ideational—and reinforces the fact that professionals cannot perform well if they operate within silos.

The game experience reveals varying levels of collaboration that students naturally exhibit. It tees up the conversation about barriers to collaborative action, smooth hand-offs, and shared responsibility for organizational performance.

Following the gameplay and scoring, a program leader guides participants through an interactive debrief that includes huddles, exercises, and discussion. Debriefing and support materials can be customized to meet distinct group needs. The exercise debrief motivates behavior change and encourages participants to put what they learned into practice as they return to class, work, and community.

Geriatric Assessment Interdisciplinary Team—*UMB and UMES*
Geriatric Assessment Interdisciplinary Team (GAIT) is an interprofessional training program for USM students interested in gerontology and geriatrics. The program—implemented by the Eastern Shore AHEC and AHEC West, with oversight by the Geriatrics and Gerontology Education and Research Program at UMB—allows students to participate in an interdisciplinary geriatric care experience through both didactic and clinical sessions.

With rotations in several rural clinical sites, GAIT participants interact with students and professionals from diverse health and human services disciplines; experience the aging process through aging simulation exercises; engage in team-building exercises that emphasize the value of an interdisciplinary approach, effective communication, and productive conflict resolution; assess geriatric patients and develop an interdisciplinary treatment plan; perform a self-assessment of team skills; and gain exposure to rural health care facilities and how they function.

Emergency Response Point-of-Dispensing Drill—*UMES*
This interdisciplinary activity introduces health professions students to the roles they can assume in response to a public health emergency, increases their familiarity with key providers used in point-of-dispensing (POD) operations, and explains the purpose and activities of each. The drill involves pharmacy, physical therapy, and kinesiology students from UMES, as well as nursing students from Salisbury University—all of whom play the role of both patient and POD provider/team member as a simulated public health crisis unfolds.

Interprofessional Approach to the Critically Ill Patient—*USG*
Interprofessional Approach to the Critically Ill Patient is a case-based elective course using high-fidelity simulation to teach teams of pharmacy, nursing, and social work students the importance of teamwork, communication, and the understanding of roles and responsibilities in an acute care environment. Students complete 10 cases over the course of the semester and submit a group SOAP note[lix] after each case. Teams also collaborate on an end-of-semester presentation and paper.

[lix] A SOAP note—subjective, objective, assessment, and plan—is a method of documenting patient encounters in the medical record, which is an integral part of practice workflow.

Poverty Simulation—*USG*

During this simulation, participants role-play the lives of low-income families across a range of circumstances—from single parents trying to care for their children, to senior citizens trying to maintain their self-sufficiency. The hour-long simulation replicates one month in the life of a poor individual or family; every 15 minutes, therefore, represents one week. Participants are assigned detailed profiles outlining—for instance—age, income, health, housing scenario, and access to health and financial resources.

The simulation brings together students and faculty from Salisbury University's respiratory therapy program, Towson University's elementary and early childhood education program, UMBC's psychology and social work departments, the University of Maryland, College Park's criminology and criminal justice department, the University of Maryland School of Pharmacy, and the University of Maryland School of Nursing at USG.

See Appendix I–B for a summary of the budget needed to scale up these Immersion activities, as well as discrete budgets for each activity.

IPE ACTIVITIES: COMPETENCE

ESCIPE—*Salisbury University and UMES*

As noted earlier, ESCIPE is run jointly by Salisbury University and UMES. The collaborative was established six years ago to support student and faculty IPE experiences, and it includes participation from all undergraduate and graduate health care professional programs at both institutions. ESCIPE offerings and programs include scope-of-practice activities, faculty development seminars, external expert speaker series, research on student and faculty perception of IPE, and exercises identifying IPE barriers and needs. See p. 95 for more details.

Clinical Rotations at Paul's Place—*UMB*

Paul's Place is a nonprofit organization serving Southwest Baltimore residents with programs in health and wellness, children and youth, and case management. These programs are intended to promote individual and family resiliency and self-sufficiency. Students collaborate in a host of tasks undertaken by the Paul's Place public health clinic, including care coordination, health education, behavior change interventions, triage, and referrals, as well as goal setting and resource identification in support of those goals.

For instance, one interdisciplinary team of students might conduct an assessment on a pediatric patient (e.g., blood pressure, health risk appraisals) and then engage in intensive clinical case management with her family to help improve abnormal assessment findings. Another team might work together to engage a high-risk patient in a day program that connects him with appropriate services and interventions.

President's Clinic—*UMB*

As noted earlier, UMB President Jay A. Perman, MD, hosts a weekly President's Interprofessional Clinic in the pediatric gastroenterology program, in cooperation with the University of Maryland School of Medicine and with the support of UMB's Center for Interprofessional Education. The clinic hosts students from all seven UMB schools: medicine, nursing, dentistry, pharmacy, law, social work, and the interdisciplinary graduate school. See p. 96 for more details.

IPE Clinics in Montgomery County—*USG*

Groups of six-to-eight pharmacy, nursing, and social work students rotate through one of three IPE clinics in Montgomery County. (In all, approximately 50 students participate over two semesters.) Students work together in teams to treat complex medical patients with uncontrolled diabetes mellitus and a psychosocial co-morbid condition, such as anxiety or depression. Patients seen in these safety-net clinics are low-income, uninsured, or underinsured.

See Appendix I–B for a summary of the budget needed to scale up these Competence activities, as well as discrete budgets for each activity.

SUPPORT IPE RESEARCH AND SCHOLARSHIP WITHIN USM

The most frequently heard complaint among academics is the lack of IPE outcomes research to justify it as an educational methodology that delivers improvements in the quality of patient care. As interest in IPE increased three decades ago, a parallel emergence of research suggested that collaborative relationships among health care providers positively affect patient, family, and provider outcomes.

There remains, however, a need for ongoing research into the efficacy of IPE as a pedagogical approach and as a means of improving patient outcomes. That need provides remarkable research opportunities not only for USM faculty directly engaged in interprofessional health care education but for faculty in other disciplines as well. Three areas in IPE are especially fertile ground for further research and scholarship:

1. Assessing the efficacy of IPE in improving patient care, safety, and outcomes;
2. Engineering a curriculum development process and framework that effectively mitigate the traditional institutional barriers to IPE curriculum design; and
3. Formulating the ideal faculty development program for those engaged in IPE.

Among its member institutions, USM has the intellectual capital and research infrastructure to become a leading producer of IPE scholarship. As an IPE thought leader, the System could help shape policy and practice in interprofessional education, even drawing on the expertise of faculty outside the health professions—e.g., business, education, engineering, economics, sociology, and information technology.

We therefore recommend that USM identify IPE scholarship priorities and opportunities, and support inter-institutional research focused on these priorities. These areas should include research into the efficacy of IPE as a pedagogical approach and as a means of improving patient outcomes, as well as scholarship that advances IPE curriculum design and faculty development. A budget for this undertaking is provided in Appendix I–B.

REFERENCES

[1] Governor's Workforce Investment Board. *Preparing Maryland's Workforce for Health Reform: Health Care 2020*. November 2011.

[2] Governor's Workforce Investment Board, Healthcare Industry Initiative Steering Committee, Allied Health Professions Subcommittee. *Maryland's Allied Health Industry Workforce Report and Recommendations*. June 2009.

[3] The Future of the Nursing Workforce: National- and State-Level Projections, 2012–2025, U.S. Department of Health and Human Services, Health Resources and Services Administration, Bureau of Health Workforce, National Center for Health Workforce Analysis, *http://bhw.hrsa.gov/sites/default/files/bhw/nchwa/projections/ nursingprojections.pdf*

[4] University System of Maryland, Office of Administration and Finance. USM Production for the Healthcare Workforce.

[5] Lateef F. Simulation-based learning: Just like the real thing. *J Emerg Trauma Shock*. 2010 Oct–Dec;3(4):348–352.

[6] Wegscheider T. Simulation in healthcare education: Is it only about money? *Safety in Health.* 2016;2:1.

[7] Maran NJ, Glavin RJ. Low- to high-fidelity simulation—A continuum of medical education? *Med Educ.* 2003;37:22–8.

[8] Buring SM, Bhushan A, et al. Interprofessional Education: Definitions, student competencies, and guidelines for implementation. *Am J Pharm Educ*. 2009;73(4).

[9] United States Department of Labor, Occupational Outlook Handbook: Registered Nurses, *http://www.bls.gov/ooh/healthcare/registered-nurses.htm*

[10] Maryland Board of Nursing, December 6, 2016, Total Number of Active Status Licenses by Type, *http://mbon.maryland.gov/Documents/information-stats.pdf*

[11] U.S. Department of Labor, Bureau of Labor Statistics, Economic News Release, Table 8. Occupations with the largest projected number of job openings due to growth and replacement needs, 2012 and projected 2022, *http://www.bls.gov/news.release/ecopro.t08.htm*

[12] The Future of the Nursing Workforce: National- and State-Level Projections, 2012–2025, *op. cit.*

[13] DHHS Health Resources and Services Administration, Bureau of Health Workforce, National Center for Health Workforce Analysis. (Jul. 21, 2017). Supply and Demand Projections of the Nursing Workforce: 2014–2030. Available at: *https://bhw.hrsa.gov/sites/default/files/bhw/nchwa/projections/ NCHWA_HRSA_Nursing_Report.pdf*

[14] DHHS Health Resources and Services Administration, Bureau of Health Workforce, National Center for Health Workforce Analysis. (Nov. 2016). National and Regional Projections of Supply and Demand for Primary Care Practitioners: 2013–2025. *Available at: https://bhw.hrsa.gov/sites/default/files/bhw/health-workforce-analysis/research/projections/primary-care-national-projections2013-2025.pdf*

[15] *Ibid*.

[16] U.S. Department of Labor, Bureau of Labor Statistics. (Jan. 30, 2018). *Occupational Outlook Handbook.* Available at: *https://www.bls.gov/ooh/healthcare/nurse-anesthetists-nurse-midwives-and-nurse-practitioners.htm#tab-6*

[17] Institute of Medicine Committee on the Robert Wood Johnson Foundation Initiative on the Future of Nursing, at the Institute of Medicine. (2011). *The Future of Nursing: Leading Change, Advancing Health*. Washington, DC: National Academies Press.

[18] Altman SH, Butler AS, Shern L. (Eds.). *Assessing Progress on the Institute of Medicine Report THE FUTURE OF NURSING*. Washington, DC: National Academies Press.

[19] American Association of Colleges of Nursing, 2011 data, available at *http://www.aacn.nche.edu/news/articles/2011/11enrolldata*; 2017 data, available at *http://www.aacn.nche.edu/student/news/2017/employment*

[20] American Association of Colleges of Nursing. (2017–2018). Enrollment and Graduation in Baccalaureate and Graduate Programs in Nursing. Washington, DC: Author.

[21] U.S. Department of Labor, Bureau of Labor Statistics, *https://www.bls.gov/oes/current/oes291141.htm*

[22] Maryland Action Coalition Summit, June 2016, abstracts for poster presentations, available at *https://www.nursing.umaryland.edu/academics/pe/MDAC-poster/*

[23] Joint Statement for Academic Progression for Nursing Students and Graduates, available at *http://www.aacn.nche.edu/aacn-publications/position/joint-statement-academic-progression*

[24] Charting Nursing's Future. (Nov. 20, 2017). "Projecting RN Supply 'Not for the Faint-Hearted.'" Available at: *https://campaignforaction.org/projecting-rn-supply-not-faint-hearted/*

[25] Covvey JR, Cohron PP, Mullen AB. "Examining Pharmacy Workforce Issues in the United States and United Kingdom." *Am J Pharm Educ* 2015 Mar 25;79(2):17.

[26] Crighton M, Toscani M, Barone J, Colaizzi J. "Are Pharmacy Schools Growing Too Fast?" *Pharmacy Times*. Feb. 15, 2016.

[27] *U.S. News and World Report*. (2017). "Best Online Master's in Nursing Programs." Available at: *https://www.usnews.com/education/online-education/nursing/rankings*

[28] Chamberlain College of Nursing's Renewal Application to Operate as an Out-of-State Institution in Maryland in Accordance with COMAR 13B.02.01. Available at: *http://mhec.maryland.gov/institutions_training/ documents/acadaff/acadproginstitapprovals/Proposals/PP16018.pdf*

[29] Maryland Higher Education Commission. (Feb. 24, 2016). *Meeting Booklet*. Available at: *http://mhec.maryland.gov/About/Documents/CommissionMeetings/022416/CBook2-24-16.pdf*

[30] National Council for State Authorization Reciprocity Agreements. (Dec. 20, 2017). "Institutions List." Available at: *http://www.nc-sara.org/files/docs/SARA_InstitutionList_122017.pdf*

[31] Maryland Board of Nursing. Information Required for Nurse Practitioner Program Approval. Available at: *http://mbon.maryland.gov/Documents/program_approval_form.pdf*

[32] Code of Maryland Regulations. Requirements for Authorization of Out-of-State Degree-Granting Institutions to Operate in Maryland. Available at: *http://mdrules.elaws.us/comar/13b.02.01.03*

[33] Maryland Board of Nursing. (Dec. 13, 2017). "Approved NP Programs." Available at: *http://mbon.maryland.gov/Documents/approved-np-programs.pdf.*

[34] Institute of Medicine. (2011). *op cit.*

[35] American Association of Colleges of Nursing. (2017–2018). *op cit.*

[36] American Association of Colleges of Nursing. (2017–18). Special Survey on Vacant Faculty Positions for Academic Year 2017–2018. Available at *www.aacnnursing.org/portals/42/news/Surveys-Data/Vacancy17.pdf*

[37] Erikson C, Hamann R, Levitan T, Pankow S, Stanley J & Whatley M. (2014). Recruiting and maintaining U.S. clinical training sites: Joint report of the 2013 multi-discipline clerkship/clinical training site survey. Retrieved June 22, 2018, from *https://members.aamc.org/eweb/upload/13-225 WC Report 2 update.pdf*

[38] Whitcomb ME. (2018). *New and developing medical schools: Motivating factors, major challenges, planning strategies*. New York, NY: Josiah Macy Jr. Foundation.

[39] Graystone R. (2017). The 2019 magnet application manual nursing excellence standards evolving with practice. *The Journal of Nursing Administration*, 47(11):527–528. Retrieved June 27, 2018.

[40] Maryland Council of Deans and Directors of Nursing Programs (2017). *Maryland Nursing Education Articulation: Policies and Procedures Manual*. Baltimore, MD: Maryland Higher Education Commission. Retrieved from *https://nursesupport.org/shared-resources/nsp-links-of-interest/*

[41] Alexander M, Durham CF, Goldman N, Hooper JI, Jeffries PR, Kardong-Edgren S . . . Tillman C. (2015). NCSBN simulation guidelines for prelicensure nursing programs. *Journal of Nursing Regulation*, 3(6):39–42. *https://doi.org/10.1016/S2155-8256(15)30783-3*

[42] Health Services Cost Review Commission. (n.d.). About Nurse Support Program II (NSPII). Retrieved June 22, 2018, from *https://nursesupport.org/nurse-support-program-ii/about-nsp-ii/*

[43] Ozelie R, Janow J, Kreutz C, Mulry MK & Penkala A. (2015). Supervision of occupational therapy level II fieldwork students: Impact on and predictors of clinician productivity. American Journal of Occupational Therapy, 69:1-7. doi:10.5014/ajot.2015.013532

[44] Josiah Macy Jr. Foundation (2015). *Enhancing health professions education through technology: Building a continuously learning health system*. New York, NY: Author.

[45] Rutgers School of Nursing (2017). *Rutgers Out-of-Hospital Nurse Residency Program*. Retrieved June 23, 2018, from *http://nursing.rutgers.edu/residency/index.html*

[46] ASAHP Task Force Report (2017). Employers' viewpoint on clinical education. *Journal of Allied Health*, 46(3):131-137.

[47] Murphy, B (2017). 50 things to know about the hospital industry. Becker's Hospital Review. Retrieved from *https://www.beckershospitalreview.com/hospital-management-administration/50-things-to-kn ow-about-the-hospital-industry-2017.html*

[48] Josiah Macy Jr. Foundation (2017). *Achieving competency-based time-variable health professions education*. New York, NY: Author.

[49] Sikki R, Morath JM, Leape L. (2015). The quadruple aim: Care, health, cost, and meaning in work. *BMJ Quality and Safety*, 24(10):608–610. doi:10.1136/bmjqs-2015-004160

[50] Passiment M, Sacks H & Huang G. Medical Simulation in Medical Education: Results of an AAMC Survey. 2011.

[51] Rosen KR. The history of medical simulation. *J Crit Care* 2008;23(2):157–166.

[52] James JT. A New, Evidence-based Estimate of Patient Harms Associated with Hospital Care. *Journal of patient safety* 2013;9(3):122–128.

[53] Tjomsland N, Baskett P. Asmund S. Laerdal. *Resuscitation* 2002;53(2):115-119.

[54] Abrahamson S, Denson JS, Wolf RM. Effectiveness of a simulator in training anesthesiology residents. *J Med Educ* 1969;44(6):515–519.

[55] Gaba DM, DeAnda A. A comprehensive anesthesia simulation environment: Re-creating the operating room for research and training. *Anesthesiology* 1988;69(3):387–394.

[56] Cooper J, Taqueti V. A brief history of the development of mannequin simulators for clinical education and training. *Quality & safety* in health care 2004;13(Suppl 1):i11–i18.

[57] Beyea SC, von Reyn LK, Slattery MJ. A nurse residency program for competency development using human patient simulation. *J Nurses Staff Dev* 2007;23(2):77–82.

[58] Ziv A, Wolpe PR, Small SD, Glick S. Simulation-based medical education: An ethical imperative. *Academic Medicine* 2003;78(8):783–788.

[59] National League of Nursing. (2015). A Vision for Teaching With Simulation. Available at: *http://www.nln.org/docs/default-source/about/nln-vision-series-(position-statements)/vision-statement-a-vision-for-teaching-with-simulation.pdf?sfvrsn=2*

[60] M. Alexander, et al. (2015). NCSBN Simulation Guidelines for Prelicensure Nursing Programs. *Journal of Nursing Regulation*. 6:39–42.

[61] Sklar DP. Interprofessional teams. *Academic Medicine* 2014;89(7):955–957.

[62] Nester J. The importance of interprofessional practice and education in the era of accountable care. *N C Med J* 2016;77(2):128–132.

[63] Centers for Medicare & Medicaid Services, Accountable Care Organizations (ACO). Retrieved January 24, 2017, from *https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/ACO/index.html?redirect=/Aco*

[64] Berry LL, Beckham D. Team-based care at Mayo Clinic: A model for ACOs. *Journal of Healthcare Management* 2014;59(1):9–13.

[65] Blum RH, Raemer DB, Carroll JS, Felstein DM, Cooper JB. Crisis resource management training for an anaesthesia faculty: A new approach to continuing education. *Medical Education* 2004;38(1):45–55.

[66] Dieckmann P, Friis SM, Lippert A, Østergaard D. Goals, success factors, and barriers for simulation-based learning. *Simulation & Gaming* 2012;43(5):627–647.

[67] Savoldelli GL, Naik VN, Hamstra SJ, Morgan PJ. Barriers to use of simulation-based education. *Can J Anaesth* 2005;52(9):944–950.

[68] McIntosh C, Macario A, Flanagan B, Gaba DM. Simulation: What does it really cost? *Simulation in Healthcare* 2006;1(2):109.

[69] Diederich E, Mahnken JD, Rigler SK, Williamson TL, Tarver S, Sharpe MR. The effect of model fidelity on learning outcomes of a simulation-based education program for central venous catheter insertion. *Simulation in Healthcare* 2015;10(6):360–367.

[70] Savoldelli GL, Naik VN, Park J, Joo HS, Chow R, Hamstra SJ. Value of debriefing during simulated crisis management: Oral versus video-assisted oral feedback. *Anesthesiology* 2006;105(2):279–285.

[71] Okuda Y, Bryson EO, DeMaria Jr S, Jacobson L, Shen B, Levine AI, et al. The utility of simulation in medical education: What is the evidence? *Mount Sinai Journal of Medicine* 2009;76(4):330–343.

[72] Interprofessional Simulation Team Training Faculty Toolkit | CHSIERP

[73] Issenberg SB, McGaghie WC, Petrusa ER, Lee Gordon D, Scalese RJ. Features and uses of high-fidelity medical simulations that lead to effective learning: A BEME systematic review. *Medical teacher* 2005;27(1):10–28.

[74] Hayden J, Smiley R, Alexander M, Kardong-Edgren S, Jefferies P. The NCSBN national simulation study: A longitudinal, randomized, controlled study replacing clinical hours with simulation in prelicensure nursing education. *Journal of Nursing Regulation* 2014;5(2):S3–S40.

[75] Alexander M, Durham CF, Hooper JI, Jeffries PR, Goldman N, Kardong-Edgren SS, et al. NCSBN Simulation guidelines for prelicensure nursing programs. *Journal of Nursing Regulation* 2015;6(3):39–42.

[76] National Center for Health Care Informatics. (2010.) Assessment of Simulation Training Needs for the Montana Healthcare Workforce. Report available upon request.

[77] "University of Nebraska Medical Center Launches Four Simulation Trucks Statewide for Rural Emergency Medical Training." Available at: *http://www.helmsleytrust.org/news/university-nebraska-medical-center-launches-four-simulation-trucks-statewide-rural-emergency*

[78] SIM–MT. Simulation in Motion—Montana. Available at: *http://www.mobilesimmontana.org/*

[79] Buring SM, Bhushan A, et al. Interprofessional education: Definitions, student competencies, and guidelines for implementation. *Am J Pharm Educ.* 2009;73(4).

[80] Reeves S, Perrier L, Goldman J, Freeth D, Zwarenstein M. Interprofessional education: Effects on professional practice and healthcare outcomes (update). Cochrane database of systematic reviews 2013(3):CD002213.

[81] Freeth D, Hammick M, Reeves S, Koppel I, Barr H. (2005). *Effective interprofessional education: Development, delivery, and evaluation. Oxford: Blackwell Publishing.*

[82] Institute of Medicine. (1972). *Report of a Conference: Educating for the Health Care Team*. Washington, DC: National Academy Press.

[83] Institute of Medicine. (2003). *Health Professions Education: A Bridge to Quality*. Washington, DC: National Academy Press.

[84] Congdon HB. *Journal of Interprofessional Education & Practice 5*(2016):53–58.

[85] Commission on Collegiate Nursing Education. (2009). S*tandards for accrditation of baccalaureate and graduate degree nursing programs*. Retrieved January 10, 2012, from American Association of Colleges of Nursing.

[86] Commission on Dental Accreditation. (2010). Retrieved January 10, 2012, from American Dental Association: *http://www.ada.org/sections/educationAndCareers/pdfs/predoc.pdf*

[87] Accreditation Council for Pharmacy Education. (January 2011). *Accreditation standards and guidelines for the professional program in pharmacy leading to the Doctor of Pharmacy degree*. Retrieved January 10, 2012, from Accreditation Council for Pharmacy Education: *https://www.acpe-accredit.org/pdf/FinalS2007Guidelines2.0.pdf*

[88] Interprofessional Education Collaborative. (2016). Core competencies for interprofessional collaborative practice: 2016 update. Washington, DC: Interprofessional Education Collaborative. Retrieved January 19, 2017, at *https://ipecollaborative.org/uploads/IPEC-2016-Updated-Core-Competencies-Report_final_release_.PDF*

[89] Hindle D, Braithwaite J, Travaglia J, Iedema R. (2006). *Patient safety: A comparative analysis of eight inquiries in six countries*. Center for Clinical Governance and Research, University of NSW.

[90] Knettel A. (2011). *Making the Business Case for Interprofessional Education and Training*. Washington, DC: Association of Academic Health Centers.

[91] World Health Organization. (2010). Framework for Action on Interprofessional Education and Collaborative Practice.

[92] University of Toronto, Health Professional Programs. (Feb. 2012). A Framework for the Development of Interprofessional Education Values and Core Competencies.

[93] Interprofessional Education Collaborative. (2016—Update). Core Competencies for Interprofessional Collaborative Practice.

[94] Association of American Medical Colleges and Howard Hughes Medical Institute. (2009). Scientific Foundations for Future Physicians.

APPENDICES

NURSING ARTICULATION AND COLLABORATION

APPENDIX N–A: NURSING PROGRAMS SURVEY

USM Health Care Workforce Working Group
Nursing Action Group Survey: Survey due December 15, 2017

Name(s) of the Person(s) Completing the Survey

_____

Work Phone Number(s)

_____

Email Address(es)

_____

Name of Higher Education Institution

_____

PART I: Increasing Nursing Enrollments by 10% in Five-Year Window

The Nursing Workforce Action Group discussed what would be a reasonable target for enrollment growth with additional financial investment by the University System of Maryland (USM). Each nursing program is being asked to project areas of growth over the next five years, including known areas of growth (e.g., University of Maryland School of Nursing offers BSN-to-DNP Family Nurse Practitioner at the Universities at Shady Grove; first cohort admitted fall 2017) and other areas of growth that are possible with additional financial investment. The Action Group has set an overall target of 10 percent enrollment growth over five years.

Table 1 provides for the known areas of growth and other potential areas of growth for each institution. Please complete the two columns for your nursing program(s). Please note that the 10 percent growth target is not designated for all nursing degrees that your institution offers. It is meant to reflect a 10 percent growth in the total nursing student body at your institution. If you do not envision growth, please note this in the table. An example of a "Known Area of Enrollment Growth" is provided for UMB–UMSON.

For "Other Potential Areas of Enrollment Growth," please provide in the chart a brief description of the proposed growth and the dollar value of the required financial investment. In an attachment to the survey, please provide additional detail on the growth plan and on the USM financial investment; this information will be shared as part of the Nursing Workforce Action Group report.

TABLE 1—KNOWN AREAS OF ENROLLMENT GROWTH AND POTENTIAL OTHER AREAS OF ENROLLMENT GROWTH FOR USM NURSING PROGRAMS OVER FIVE-YEAR PERIOD

Institution	Known Areas of Enrollment Growth	Other Potential Areas of Enrollment Growth and Financial Investment
Bowie		
Coppin		
Frostburg		
Salisbury		
Towson		
UMUC		
UMB–UMSON	Fall 2017—Admitted first cohort to BSN–DNP Family Nurse Practitioner; in 6th year, will be at full enrollment, with approx. 100 additional students.	

PART II: Approaches for Improving NCLEX-RN Pass Rates

1. Do you have a vendor-produced NCLEX preparation package (e.g., HESI, Kaplan) that you provide your students as part of their educational experience?
   _____ No _____ Yes (skip to question 3)

2. If no, is your nursing program considering using a vendor-produced NCLEX preparation package?
   _____ No _____ Yes

3. If yes, please provide the specific components of the package that you use in your entry-level program (check all that apply):
   _____ Content area review materials and sample exam questions
   _____ End-of-program exam
   _____ Content-/course-specific exams
   _____ In-person NCLEX review course
   _____ Other (specify) _____
   _____
   _____

4. If yes, how does your program pay for the costs associated with the NCLEX preparation package?
   _____ Costs are covered by students (e.g., student fee)
   _____ Costs are grant-supported (e.g., Nurse Support Program II grant)
   _____ Institution covers the costs
   _____ Other (specify) _____
   _____
   _____

5. Do you currently have Nurse Support Program II funding to enhance entry-level nursing student success?
   ____ No ____ Yes (please describe) _____

   And if yes, do you have a plan for sustaining post-NSP II funding?
   ____ No ____ Yes

6. Would your entry-level nursing program be interested in identifying five faculty NCLEX champions to participate in a two-day summit to be held in Maryland on best practices? All costs would be covered.
   ____ No ____ Yes

7. Would your entry-level nursing program be interested in receiving expert consultation to support your efforts to improve your NCLEX pass rates? All costs would be covered.
   ____ No ____ Yes

8. What other student support services do you offer that may impact NCLEX exam pass rates?

9. What other suggestions/initiatives should the Nursing Workforce Action Group consider in relation to improving USM nursing programs' first-time pass rate on the NCLEX?

PART III: Implementing a 15% Salary Differential for Adjunct II Compensation

All nursing programs rely on qualified adjunct faculty, and the vast majority of adjuncts provide clinical instruction in entry-level programs. It is critical that adjunct faculty be willing to maintain their affiliation with a nursing program over multiple semesters.

It is recommended that the USM Policy on the Employment of Adjunct Faculty in the University System of Maryland (II–1.07)—as it relates to Adjunct II faculty—be implemented across all nursing programs, with a 15 percent increase in compensation.[1] Funding will be requested from the University System of Maryland to underwrite this retention strategy. Please complete Table 2 for your institution.

[1] UMB–UMSON has operationalized "Adjunct II" as a faculty member teaching at least one clinical section for six semesters within a five-year window.

TABLE 2—TOTAL COSTS ASSOCIATED WITH IMPLEMENTING ADJUNCT II POLICY FOR ADJUNCT NURSING FACULTY WITH 15% SALARY ADJUSTMENT

Institution	Estimated Annual Incremental Expense	Estimated Number of Adjunct II Faculty
Bowie		
Coppin		
Frostburg		
Salisbury		
Towson		
UMUC		
UMB–UMSON		

Thank you for completing this survey.

It should be returned to:

Jane Kirschling, PhD, RN, FAAN
Chair, Nursing Workforce Subgroup of Health Care Workforce Working Group
Dean and Professor
University of Maryland School of Nursing
655 W. Lombard St., Suite 505
Baltimore, MD 21201
410-706-6740 (office) 443-691-5222 (cell) 410-706-4231 (fax)
kirschling@umaryland.edu

APPENDIX N-B: NURSING PROGRAMS IN MARYLAND

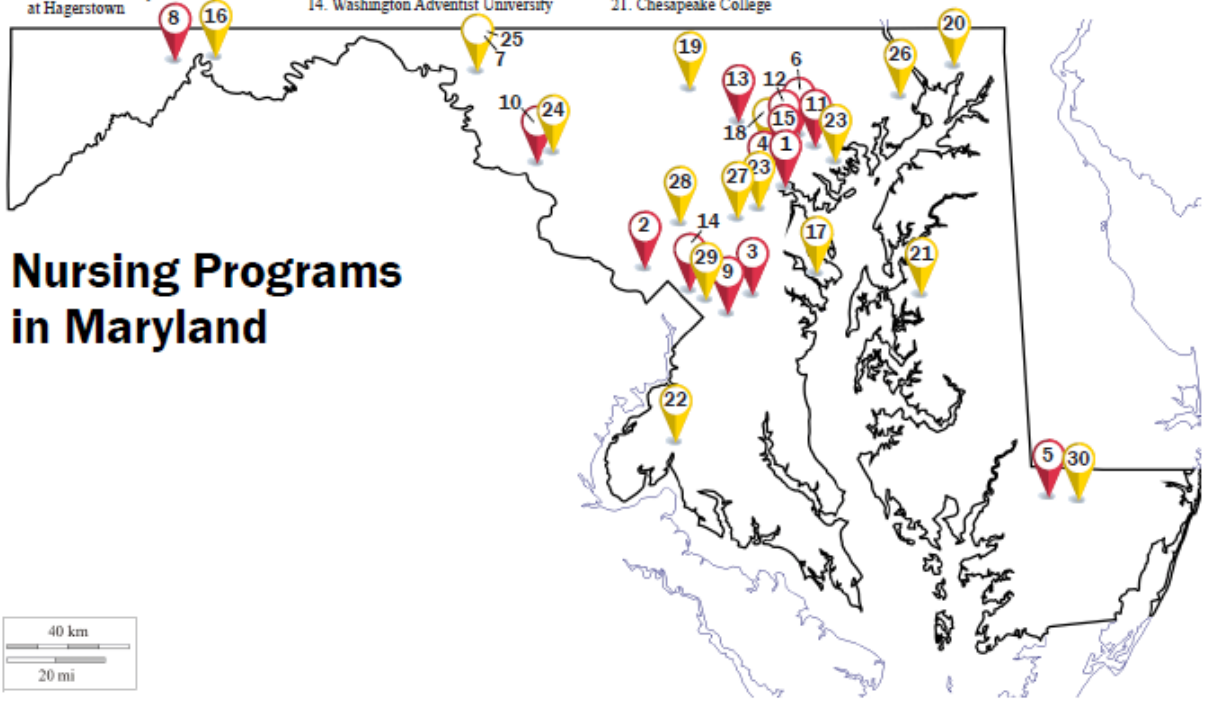
USM Entry-Level BSN Programs (BSN and RN-BSN)
1. University of Maryland School of Nursing (UMB)
2. UMSON at the Universities at Shady Grove (USG)
3. Bowie State University
4. Coppin State University
5. Salisbury University
6. Towson University
7. Towson University at Hagerstown

USM RN-BSN Programs
8. Frostburg State University
9. University of Maryland, University College

Private Maryland Entry-Level BSN Programs
10. Hood College
11. Morgan State University
12. Notre Dame of Maryland University
13. Stevenson University
14. Washington Adventist University

Direct Entry Master's Programs
15. Johns Hopkins University
1. University of Maryland School of Nursing (UMB)

Associate Degree Programs (ADN)
16. Allegany College of Maryland
17. Anne Arundel Community College
18. Baltimore City Community College
19. Carroll Community College
20. Cecil Community College
21. Chesapeake College
22. College of Southern Maryland
23. Community College of Baltimore County-Catonsville/Essex
24. Frederick Community College
25. Hagerstown Community College
26. Harford Community College
27. Howard Community College
28. Montgomery College
29. Prince Georges Community College
30. Wor-Wic Community College



APPENDIX N–C: MARYLAND NURSING PROGRAMS: LOCATION(S), BS/BSN AND/OR RN-TO-BSN, AND GRADUATE DEGREES

USM Entry Level BSN Programs	Location(s)	BSN and/or RN-to-BS(N)	Graduate Degrees[1]
Bowie State University	Bowie	BSN RN-to-BSN	Master of Science
Coppin State University	Baltimore	BSN RN-to-BSN	Master of Science Post-Master's FNP Certificate
Salisbury University	Salisbury	BS RN-to-BS	Master of Science RN to MS Master of Science Doctor of Nursing Practice
Towson University	Towson	BS RN-to-BS	Master of Science
UMB–UMSON	Baltimore & Rockville (at USG)	BSN RN-to-BSN	Master of Science RN-to-MS Master of Science Doctor of Nursing Practice PhD
USM RN-TO-BSN Programs	**Location(s)**	**BSN and/or RN-to-BSN**	**Graduate Degrees**
Frostburg State University	Frostburg	RN-to-BSN	Master of Science
UMUC	Largo	RN-to-BSN	–
Private Maryland Entry-Level BSN Programs	**Location**	**BSN and/or RN-to-BSN**	**Graduate Degrees**
Hood College	Frederick	BSN & RN-to-BSN	–
Morgan State University	Baltimore	BSN	Master of Science PhD
Notre Dame of Maryland University	Baltimore	BSN RN-to-BSN	Master of Science
Stevenson University	Stevenson	BSN RN-to-BSN	Master of Science RN-to-MSN Master of Science
Washington Adventists University	Takoma Park	BSN	Master of Science RN-to-MSN Master of Science
Direct-Entry Master's Programs	**Location**	**Direct-Entry Master's**	**Graduate Degrees**
Johns Hopkins University	Baltimore	Direct Entry Master's	Master of Science Doctor of Practice PhD
UMSON	Baltimore	Direct Entry-Master's	See above
Graduate Programs			
Uniformed Services University of the Health Sciences	Bethesda	—	Master of Science Doctor of Nursing Practice PhD

Associate Degree Programs	Location(s)
Allegany College of Maryland	Cumberland
Anne Arundel Community College	Arnold
Baltimore City Community College	Baltimore
Carroll Community College	Westminster
Cecil College	North East
Chesapeake College	Wye Mills
College of Southern Maryland	LaPlata
CCBC—Catonsville/Essex	Catonsville/Essex
Frederick Community College	Frederick
Hagerstown Community College	Hagerstown
Harford Community College	Bel Air
Howard Community College	Columbia
Montgomery College	Takoma Park/Silver Spring
Prince Georges Community College	Largo
Wor-Wic Community College	Salisbury

Note: Graduate programs identified from Nursing Support Program (NSP) website — https://nursesupport.org//nurse-support-program-ii/grants/nursing-programs

APPENDIX N–D: AACN Faculty Salary Information for Calendar Year and Academic Year—Maryland, North Atlantic, and National

2015-2016 Full-Time Nurse Faculty Calendar Year Based Salaries by Rank and Degree Level: Maryland, North Atlantic, and National Data[1]

Maryland Data
(N=12 Schools)

RANK AND DEGREE	Valid N	Mean	SD	Min	Max	25th	50th	75th
Professor								
Doctoral	30	$159,014	$51,466	$85,556	$275,000	$118,629	$150,129	$216,000
Nondoctoral	0	.	.	.	.	.	.	.
Associate Professor								
Doctoral	46	$127,750	$30,399	$82,601	$208,959	$105,465	$118,088	$146,834
Nondoctoral	2	.	.	.	.	.	.	.
Assistant Professor								
Doctoral	126	$102,778	$15,725	$63,556	$165,396	$94,262	$101,352	$108,248
Nondoctoral	41	$88,490	$13,499	$73,333	$131,300	$79,556	$85,482	$94,561
Instructor								
Doctoral	16	$97,231	$12,179	$81,192	$130,000	$87,935	$95,025	$105,030
Nondoctoral	39	$89,280	$17,592	$61,200	$156,086	$81,718	$84,982	$93,500
Maryland Total	332	$106,302	$30,994	$58,939	$275,000	$86,313	$99,825	$112,382

2015-2016 Full-Time Nurse Faculty Calendar Year Based Salaries by Rank and Degree Level: Maryland, North Atlantic, and National Data, cont.[1]

North Atlantic Data
(N=169 schools)

	Valid N	Mean	SD	Min	Max	25th	50th	75th
Professor								
Doctoral	355	$150,384	$47,554	$61,345	$414,517	$119,449	$140,668	$171,908
Nondoctoral	9	$125,015	$13,022	.	.	.	.	.
Associate Professor								
Doctoral	571	$110,910	$22,105	$42,422	$246,871	$95,965	$108,345	$123,838
Nondoctoral	59	$95,162	$22,229	$55,355	$193,000	$79,444	$95,000	$103,938
Assistant Professor								
Doctoral	895	$96,210	$19,372	$33,000	$229,500	$85,000	$93,537	$106,876
Nondoctoral	460	$83,463	$16,056	$43,622	$210,000	$72,336	$82,273	$93,391
Instructor								
Doctoral	61	$85,321	$18,564	$56,000	$141,450	$73,172	$82,800	$92,103
Nondoctoral	423	78,631	15,519	39,533	155,000	68,706	78,000	86,741
North Atlantic Total	3,257	99,735	31,923	6,722	414,517	80,372	93,179	110,592

2015-2016 Full-Time Nurse Faculty Calendar Year Based Salaries by Rank and Degree Level: Maryland, North Atlantic, and National Data, cont.[1]

National Data
(N=801 schools)

	Valid N	Mean	SD	Min	Max	25th	50th	75th
Professor								
Doctoral	1,703	$133,928	$42,173	$40,179	$414,517	$104,368	$124,942	$156,000
Nondoctoral	48	$90,896	$22,037	$53,040	$143,365	$76,920	$83,405	$108,477
Associate Professor								
Doctoral	2,617	$105,790	$23,549	$42,422	$246,871	$90,000	$102,152	$117,000
Nondoctoral	478	$82,350	$16,798	$47,160	$193,000	$71,245	$80,000	$89,466
Assistant Professor								
Doctoral	3,734	$92,748	$17,600	$33,000	$229,500	$82,500	$90,736	$100,222
Nondoctoral	2,940	$77,022	$14,745	$36,745	$210,000	$67,222	$75,351	$84,562
Instructor								
Doctoral	372	$84,656	$16,342	$36,153	$161,200	$74,841	$83,005	$91,473
Nondoctoral	3,207	$73,481	$14,377	$30,740	$185,400	$64,778	$72,000	$80,833
National Total	18,125	$90,112	$28,218	$30,740	$414,517	$72,111	$84,996	$100,139

[1] For inclusion in the salaries analysis, the following variables must be reported: professional status (nurse/nonnurse), degree level (doctoral degree or no doctoral degree), faculty rank, salary, and salary basis (academic or calendar year). To protect confidentiality, the mean is not presented when there are less than 5 individuals in a given category.

SOURCE: American Association of Colleges of Nursing, *Research and Data Services*, 2016.
AACN is not responsible for errors in reporting by respondent institutions.

2015-2016 Full-Time Nurse Faculty Academic Year Based Salaries by Rank and Degree Level: Maryland, North Atlantic, and National Data[1]

	Maryland Data (N=12 Schools)							
RANK AND DEGREE	Valid N	Mean	SD	Min	Max	25th	50th	75th
Professor								
Doctoral	30	$130,102	$42,109	$70,000	$225,000	$97,060	$122,833	$176,727
Nondoctoral	0	.	.	.	.	.	.	.
Associate Professor								
Doctoral	46	$104,523	$24,872	$67,583	$170,966	$86,290	$96,617	$120,137
Nondoctoral	2	.	.	.	.	.	.	.
Assistant Professor								
Doctoral	126	$84,091	$12,866	$52,000	$135,324	$77,123	$82,925	$88,567
Nondoctoral	41	$72,401	$11,045	$60,000	$107,427	$65,091	$69,940	$77,368
Instructor								
Doctoral	16	$79,553	$9,964	$66,430	$106,364	$71,946	$77,748	$85,934
Nondoctoral	39	$73,048	$14,394	$50,073	$127,707	$66,860	$69,531	$76,500
Maryland Total	332	$86,974	$25,359	$48,223	$225,000	$70,620	$81,675	$91,949

2015-2016 Full-Time Nurse Faculty Academic Year Based Salaries by Rank and Degree Level: Maryland, North Atlantic, and National Data, cont.[1]

North Atlantic Data
(N=169 schools)

	Valid N	Mean	SD	Min	Max	25th	50th	75th
Professor	355	$123,041	$38,907	$50,191	$339,150	$97,731	$115,092	$140,652
Doctoral	9	$102,285	$10,654	.	.	.	.	.
Nondoctoral								
Associate Professor								
Doctoral	571	$90,745	$18,086	$34,709	$201,985	$78,517	$88,646	$101,322
Nondoctoral	59	$77,859	$18,187	$45,290	$157,909	$65,000	$77,727	$85,040
Assistant Professor								
Doctoral	895	$78,718	$15,850	$27,000	$187,773	$69,545	$76,530	$87,444
Nondoctoral	460	$68,288	$13,137	$35,691	$171,818	$59,184	$67,315	$76,411
Instructor								
Doctoral	61	$69,808	$15,188	$45,818	$115,732	$59,868	$67,745	$75,357
Nondoctoral	423	$64,334	$12,698	$32,345	$126,818	$56,214	$63,818	$70,970
North Atlantic Total	3,257	$81,601	$26,119	$5,500	$339,150	$65,759	$76,237	$90,484

2015-2016 Full-Time Nurse Faculty Academic Year Based Salaries by Rank and Degree Level: Maryland, North Atlantic, and National Data, cont.[1]

National Data
(N=801 schools)

	Valid N	Mean	SD	Min	Max	25th	50th	75th
Professor								
Doctoral	1,703	$109,578	$34,505	$32,874	$339,150	$85,392	$102,225	$127,636
Nondoctoral	48	$74,370	$18,030	$43,396	$117,299	$62,935	$68,241	$88,754
Associate Professor								
Doctoral	2,617	$86,555	$19,267	$34,709	$201,985	$73,636	$83,579	$95,727
Nondoctoral	478	$67,377	$13,743	$38,585	$157,909	$58,291	$65,455	$73,199
Assistant Professor								
Doctoral	3,734	$75,885	$14,400	$27,000	$187,773	$67,500	$74,239	$82,000
Nondoctoral	2,940	$63,018	$12,064	$30,064	$171,818	$55,000	$61,651	$69,187
Instructor								
Doctoral	372	$69,264	$13,370	$29,580	$131,891	$61,233	$67,913	$74,842
Nondoctoral	3207	$60,121	$11,763	$25,151	$151,691	$53,000	$58,909	$66,136
National Total	18,125	$73,728	$23,088	$25,151	$339,150	$59,000	$69,542	$81,932

[1] For inclusion in the salaries analysis, the following variables must be reported: professional status (nurse/nonnurse), degree level (doctoral degree or no doctoral degree), faculty rank, salary, and salary basis (academic or calendar year). To protect confidentiality, the mean is not presented when there are less than 5 individuals in a given category.

SOURCE: American Association of Colleges of Nursing, *Research and Data Services*, 2016.
AACN is not responsible for errors in reporting by respondent institutions.

APPENDIX N–E: NSPII Funding, Fiscal Year 2017

Final Recommendations for funding for FY 2017 Competitive Institutional Grants

Grant #	Institution	Grant Title	Proposed Funding
17-102	CCBC	Expanded Pathways to BSN	$1,085,971
17-104	Chesapeake College	Academic Progressions in Nursing	$913,399
17-106	Hood College	Baccalaureate Nursing at Hood College	$1,351,867
17-107	John Hopkins Univ.	Nurse Faculty for the Future	$1,023,932
17-108	Morgan State Univ.	SAM II	$784,438
17-110	Notre Dame	RN to BSN	$1,716,608
17-112	Salisbury University	BS Bound	$74,299
17-114	Stevenson University	Progress through Partnerships	$1,363,848
17-115	University of Maryland	Care Coordination Specialty	$255,198
17-116	University of Maryland	Care Coordination & Case Management	$113,701
17-117	University of Maryland	Collaborative NP Clinical Training	$945,866
17-119	University of Maryland	Developing Educators to Teach Online	$80,970
17-120	University of Maryland	Faculty Mentorship Program II	$350,031
17-121	University of Maryland	FNP Expansion to Shady Grove	$1,586,781
17-123	University of Maryland	Project RUSH- PhD Program	$595,210
17-124	University of Maryland	Psychiatric MH FNP	$168,924
17-125	John Hopkins Univ.	Inter-professional Education	$1,692,335
17-126	University of Maryland	RN- BSN or MSN Clinical Faculty	$3,120,506
17-127	Montgomery College	Military to Associate Degree	$341,594
		TOTAL	**$17, 565,478**

http://www.hscrc.state.md.us/documents/commission-meeting/2016/04-13/HSCRC-Public-Pre-Meeting-Packet-2016-04-13.pdf

APPENDIX N–F: KNOWN AREAS OF ENROLLMENT GROWTH & POTENTIAL AREAS OF ENROLLMENT GROWTH IN USM NURSING PROGRAMS OVER 5 YEARS

Institution	Known Areas and Potential Other Areas of Enrollment Growth and Financial Investment
Bowie	**Traditional Nursing Students**. For Fall 2018, expect to have a large number of traditional students apply to begin completing the prerequisites. Expect to have a total of 600+ students. Potential areas of growth: Each year for the past several years, we have turned away students interested in applying for our **Family Nurse Practitioner (FNP) program** due to limited faculty and the practice ratio guideline of a limited number of students to each faculty. Estimate FNP student enrollment to increase to 50 in each class with a requirement for at least 3 more faculty nurse practitioners with doctorates. **Total request from USM: $234,000, which would increase the cohort enrollment to 50 within 3 years.** **Accelerated Baccalaureate program**. Need at least 3 more full-time faculty in the undergraduate program for obstetrics, pediatrics, and medical surgical nursing. **Total request from USM: $250,000, which would increase the undergraduate enrollment in this track to 75 within 4 years.** **Nurse Educator students**. Exploring a distance-learning cohort in Southern Maryland. Estimate each class to consist of 15–20 students with **75–100 total students over 5 years**. Need 3 additional doctoral faculty members. **Total request from USM: $275,000.** On main campus, expect to grow Nurse Educator classes to an enrollment of 25–30 per class, equating to **150 students over 5 years**; 2 additional faculty are needed. **Total request from USM: $184,000.**

Coppin	At Coppin's Helene Fuld School of Nursing, there are three known areas of growth over the next 5 years: the Accelerated Second-Degree program (ASDBSN), the RN-to-BSN program, and the Post Master's DNP program. A projected area of growth is the Associate-to-Bachelor's degree (ATB), as this program would align with the RN-to-BSN plan of study. Minimally, the goal is to increase the ASDBSN, the RN-to-BSN, and the Post-Master's DNP by 100 percent. Currently, these programs average 17–18 students each. Overall, the financial investment includes marketing resources; a dedicated coordinator; designated faculty for the ASDBSN and RN-to-BSN program; two additional faculty for the Post Master's DNP program; and an administrative staff member. Currently, the faculty members are shared among three programs (traditional, ASDBSN, and RN-to-BSN), and the staff member is funded through a grant. The **ASDBSN program** enrollment can be doubled with designated faculty members. A minimum of three 12-month FTE faculty members is recommended, as the program is offered over a full year. Each faculty member is $90,000 ($117,000 with fringe), meaning that the **total request from USM is $351,000, which would yield enrollment growth of 18–24 students within 5 years.** The **RN-to-BSN program** enrollment can be doubled with designated faculty members. A minimum of three 12-month FTE faculty members is recommended, given that the program can be offered over a full year. (It's anticipated that offerings would increase to include spring and summer admissions.) Each 12-month faculty member is $90,000 ($117,000 with fringe), so the financial investment would be $351,000 for the faculty members and $50,000 ($65,000 with fringe) for the administrative assistant. **Total request from USM is $416,000, which would yield enrollment growth of 18–24 students within 5 years.** The **Post Master's DNP** program's projected 5-year full enrollment capacity is 50 students. In addition to the current full-time faculty members, three additional faculty members and adjunct faculty are needed. A designated staff member is also needed, given that one is currently shared with the master's program. Each 12-month FTE faculty member is $90,000 ($117,000 with fringe), so the financial investment would be $351,000 for the faculty members and $50,000 ($65,000 with fringe) for the administrative assistant. **Total request from USM is $416,000, which would yield enrollment growth of 24–33 students (beyond the 50 students already projected).** Thus, the program expansion would increase to a new cap of at least 74 students. In addition to the growth areas identified above, the **ATB program** represents an area of potential growth pending dual-enrollment MOUs with area community colleges. A designated coordinator or program specialist is recommended. The annual salary of the non-nurse program specialist is approx. $70,000 ($91,000 with fringe). **Total request from USM is $91,000, yielding an additional 24 ATB graduates within 5 years.** The master's degree track has potential for growth in the **Master of Science in Nursing Education (MSNE)**. At the doctoral level, there is potential for growth in the Post Master's DNP and the BSN-to-DNP. The MSNE program is proposed to begin in fall 2019. A minimum of two designated faculty members would be needed for a cohort of 18–24 students. We recommend that a doctorally prepared faculty member be hired as a 12-month FTE, with a salary of approx. $95,000 ($123,500 with fringe). In addition, a staff member is recommended, as the current MSN administrative assistant is supported with grant funds. The salary allocation for the administrative assistant is $50,000 ($65,000 with fringe). **Total request from USM is $312,000 to support an additional 18–24 enrolled students within 5 years.** The **BSN-to-DNP program** is projected to begin fall 2019. A minimum of two designated faculty members are needed for a cohort of 12–18 students. The recommendation is that two doctorally prepared faculty members be hired as 12-month FTEs, with a salary of $95,000 ($123,500 with fringe). In addition, a staff member is recommended, with a salary of $50,000 ($65,000 with fringe). **Total request from USM is $312,000, which would yield an enrollment increase of 18 students by year 5.** Program marketing funds would be required for mass media, web-based marketing, collateral materials, and advertising. Total marketing requested is $50,000. **Total request is $1,912,000 (staffing) plus $50,000 (marketing) = $1,948,000, for an enrollment growth of 147 students by year 5.**

Frostburg	Fall 2018 to admit first cohort of PMHNP and FNP students. In 5 years, full enrollment is estimated at **60 students**. BSN collaboration with Allegany College will admit first full cohort of 15 students to begin the dual-enrollment program in fall 2018. Full enrollment estimated at **40 students in 3 years**. Growth potential—**Associate-to-Bachelor's/Dual Enrollment:** Currently there are 100+ students dually enrolled at Frostburg State and one of seven community colleges. MHEC NSP II awarded a 5-year implementation grant in July 2015; the project is now in its third year. This is a potential area of growth as additional articulation agreements are executed. It will be imperative to keep currently designated faculty and staff exclusively working with this special student population. **Total request is $217,350** ($56,350 fringe) **annually.** **Doctor of Nursing Practice (DNP) Planning:** MHEC NSP II awarded a 2-year planning grant in July 2016. This is an area of potential growth pending the outcome of the needs assessment to be completed by May 2018.
Salisbury	BS–DNP program—additional 18 students enrolled in the program, for a total of **60 DNP** students within 5 years. Growth potential—Salisbury University is requesting **$250,000 per year for 5 years to initiate an RN-to-BS program growing to 32 students per year**. This budget reflects faculty positions (including a Director position with fringe), equipment, course redevelopment, advertising, recruitment, and startup costs. **MS program**—growth in Nurse Educator program (approximate costs for advertising and course redevelopment = **$50,000**/5 years). Annual number of students to reach a minimum of 8, with growth to 12. **Total request is $1,300,000**.
Towson	Fall 2012, admitted first group of 16 ATB (Associate-to-Bachelor's) students. Fall 2017, degree completion option (ATB and RN-to-BS) continues to grow with more than 400 enrolled students; plan is to increase to 700 by 2020, for a total of **300 additional students**. Other areas of enrollment growth: Fall 2018, offer online ATB and RN-to-BS degree completion option. In third year, estimate full enrollment at 100 additional students. Currently grant-funded for 2 more years. Request two additional doctorally prepared faculty members after grant ends to maintain faculty needed for program. **Total request: $220,000 annually.** A Master's Entry Into Practice program is a potential area of growth. We would admit approx. 25 students each semester (50 per year). Three faculty lines at $84,000 plus fringe (total = $355,320 each) and one full-time staff person to manage simulation ($70,000 plus fringe = $98,700) would be needed. In addition, funds for adjunct faculty to cover clinical courses would be required ($150,000 per year). Total request: **$321,000 annually**.
UMUC	In fall 2017, admission criteria for the Nursing for Registered Nurses program was expanded to include graduates with nursing diplomas, in addition to associate degree students. UMUC is considering expanding program eligibility to residents of other states, but no final determinations have been made at this time.

UMB–UMSON	Fall 2017, admitted first cohort to the **BSN–DNP Family Nurse Practitioner program** at the Universities at Shady Grove. In 6th year, the program will be at full enrollment, with an estimated 100 additional students. Have secured funding support from USG for startup and from USM to sustain program post-NSP II grant funding. **RN-to-BSN** enrollment: Potentially 10–20 new admits per year increase, starting fall 2018, as a result of dual-admission agreements. Assuming RN-to-BSN students complete the program in 2 years, on average, it reflects a total growth of 30 students (15 a year) by fall 2020. No additional funding is needed. **Clinical Nurse Leader Master's Entry program** (for second degree students). Currently admitting 56 students in fall and spring semesters to the 4-semester program. Will increase enrollment by five students each semester—or 10 students annually—beginning in fall 2019, for a total growth of 20 students by fall 2021. The school will hire adjunct faculty to offer clinical instruction during the 4-semester program of study, and the new tuition revenue will offset this expense. Potential to offer **three DNP core courses** and the **BSN–DNP Adult–Gerontology Acute Care Nurse Practitioner program** in Northeastern Maryland at the University Center. By offering the three DNP core courses, students could take the courses locally (without travel to Baltimore). This would allow UMSON to increase enrollment in selected BSN–DNP specialties by an estimated 14–16 students/year. UMSON would submit an NSP II proposal to support the startup and would request **$250,000 in recurring funds** from USM (in year 4) to support marketing costs, faculty salary for delivery of the three courses, and an onsite coordinator. In addition, UMSON would offer the specialty courses for the Adult–Gerontology Acute Care Nurse Practitioner program entirely at the Northeastern location. The plan is to admit 10 students annually. Once fully operationalized in year 5, we estimate an additional 50 DNP students. (This is a conservative estimate and will ultimately depend on student demand and an ability to recruit a doctorally prepared Acute Care Nurse Practitioner faculty member.) UMSON would submit an NSP II grant in FY 2020 (for fall 2020 admission) to support the startup of these doctoral offerings—at an estimated expense of $1.5 million—**and would need sustaining funds from USM in year 6 at approx. $500,000**.

APPENDIX N–G: USM APPROACHES FOR IMPROVING NCLEX-RN PASS RATES FOR ENTRY-LEVEL STUDENTS

Question	Responses
Do you have a vendor-produced NCLEX preparation package (e.g., HESI, Kaplan) that you provide your students as part of their educational experience?	Yes – Bowie, Coppin, Salisbury, Towson, UMSON

Please provide the specific components of the package that you use in your entry-level program. Check all that apply.	• Content area review materials and sample exam questions – Bowie, Coppin, Towson, UMSON
	• End-of-program exam – Bowie, Coppin, Salisbury, Towson, UMSON
	• Content-/course-specific exams – Bowie, Coppin, Salisbury, Towson, UMSON
	• In-person NCLEX review course – Bowie, Coppin, Towson, UMSON
	• Other
	  ○ Encourage students to use UWORLD and Kaplan – Bowie
	  ○ Computerized adaptive testing – Coppin
	  ○ Integrated tests within clinical courses are administered at the end of semester/course – UMSON

How does your program pay for the costs associated with the NCLEX preparation package?	• Costs are covered by students (e.g., student fee) – Bowie, Coppin, Salisbury, Towson, UMSON • Costs are grant-supported (e.g., NSP II grant) – Bowie

Do you currently have Nurse Support Program II funding to enhance entry-level nursing student success?	• No – Salisbury, Towson, UMSON
	• Yes
	  ○ Bowie ("Somewhat" has a plan for sustaining post-NSP II funding)
	  ○ Coppin (Has a plan for sustaining post-NSP II funding)

Would your entry-level nursing program be interested in identifying five faculty NCLEX champions to participate in a two-day best practices summit in Maryland (with all costs covered)?	Yes – Bowie, Coppin, Salisbury, Towson, UMSON
Would your entry-level nursing program be interested in receiving expert consultation to support your efforts to improve your NCLEX pass rates (with all costs covered)?	Yes – Bowie, Coppin, Towson, UMSON
What other student support services do you offer that may impact NCLEX exam pass rates?	• Bowie – Nursing Student Success Center, which provides tutorial assistance; Assessment Technology Institute (ATI) offers opportunities for remediation in which faculty work with students face-to-face and one-on-one; ATI for focus studying and proctored exam; I CAN for Early Alert, faculty guidance, and rubrics • Coppin – Junior and senior coaching, weekly content, supplemental sessions, co-curricular experiences such as memory loss events, caregivers awareness, breast cancer awareness, power to end stroke, and HIV awareness; test-taking strategy reviews • Towson – One full-time person who reviews exams and some content • Salisbury – One-on-one advising with nursing faculty

What other suggestions/initiatives should the Nursing Workforce Action Group consider in relation to improving USM nursing programs' first-time pass rate on the NCLEX?	• Bowie – Strengthening students in their clinical practice with application. In this regard, Bowie students could benefit from a summer (10–12 week) internship while in the program. This could be part of the Transition Into Professional Nursing Practice Course in level 4. Incentivize all faculty—those facilitating theory *and* clinical practice—to have a few days of hands-on clinical practice to maintain awareness of actual state-of-the-art practice in a variety of settings. • Coppin – Ongoing test-taking skills seminars, best practices webinars, study skills • Salisbury – Reviewing curricula across programs • UMSON – Add an NCLEX Champion as part of Student Success Center services. Maximize resources and use of NCLEX preparation packages. Develop supports for ESL students. To enhance advising, create systems to monitor course and vendor-test achievement; develop Systemwide approach to better understand practices for enhancing NCLEX success; seek NSP II funding support for initiatives related to NCLEX success.

APPENDIX N–H: BUDGET—USM NURSING FACULTY SUMMIT: OPTIMIZING FIRST-TIME CANDIDATE PERFORMANCE ON THE NCLEX-RN

Event

Two Days: Participants arrive the evening before Day 1 and leave after the end of the program on Day 2.

Central Location: College Park Marriott Hotel & Conference Center, College Park, MD

Cost coverage includes travel, food, and two nights hotel lodging, as well as A/V equipment, flip chart package, service charge, and Maryland tax.

Program

Participants: This program is designed to bring together up to five faculty from each USM nursing program (Bowie, Coppin, Salisbury, Towson, UMSON), for a maximum of 25 participants.

Primary Objective: Faculty attending will participate in professional development designed to explore best practices in Optimizing First-Time Candidate Performance on the NCLEX-RN.

This summit was conceptualized to include a **facilitator** with extensive relevant content expertise in all aspects of the program. This role is critical to assuring adequate planning and focus to meet participant needs related to NCLEX student performance and ultimately to improve the overall pass rate for each program's first-time NCLEX takers.

In addition, **five consultants**, each with extensive relevant content expertise, are included in the budget. Before the summit, each consultant will work with one of the participating schools to: 1) create a survey and background report summarizing the school's relevant data and current practices; and 2) provide a data-based springboard for developing a school-specific action plan. The consultants may also participate in various active learning exercises during the summit. ***The consultant budget is provided in Appendix E.***

It is anticipated that the facilitator and consultants will need one day to finalize all aspects of their work together at the summit, so three nights of hotel and related expenses are included in the budget.

Smooth operation of this program will require one **UMSON nursing faculty member** to coordinate the summit program, facilitate preliminary and onsite preparations, and manage delivery of the program for the duration of the summit. This faculty member will be supported by **one staff member** throughout the summit, and the budget for both the faculty member and staff member is included in this summary. The faculty member must also be present at the one-day meeting of the facilitator and consultants.

Hotel costs—including guest rooms, meeting rooms, equipment, and catering—are estimated.

2-DAY SUMMIT: OPTIMIZING SUCCESS ON THE NCLEX-RN FOR FIRST-TIME EXAM TAKERS					
Expense			Unit Charge	Amount (#)	Total
Facilitator					
	Fee		$1,500.00	2	$3,000.00
	Hotel	$155 + $9.30 + $10.85 per person/per night	$175.15	1 person/3 nights	$525.45
	Travel		$600.00	1	$600.00
	Per Diem		$ 47.00	2	$94.00
		Subtotal			$4,219.45
Faculty Coordinator					
	Salary and Benefits	.05 FTE for 6 mos.	$7,205.97	.50	$3,602.99
	Hotel	$155 + $9.30 + $10.85 per person/per night	$175.15	1 person/3 nights	$525.45
		Subtotal			$4,128.44
Staff Support					
	Compensation	% FTE	$57,490	0.05	$2,874.50
	Hotel	155 + 9.30 + 10.85 per person/per night	$175.15	1 person/3 nights	$525.45
	Mileage ($0.54/mile)	0.54 x miles x round trip	$0.54	50	$27.00
	Per Diem		$25.00	1	$25.00
		Subtotal			$3,451.95
Materials					
	Registration (online)	Event Rebel	$150.00	1	$150.00
	Badges	Badge holders/cards for printing kit	$50.00	1	$50.00
	Onsite Program	Printing/duplication	$0.10	250	$25.00
	Signage				
		Design	$82.00	1	$82.00
		Printing	$110.00	2	$220.00
		Subtotal			$527.00
Hotel					
	Guest Room and Tax	$155 + $9.30 + $10.85 per person/per night x 2 nights	$175.15	25 people/2 nights	$8,757.50
	Audio-Visual Support				
		LCD & screen per room/per day	$550.00	2	$1,100.00
		Flip chart package	$65.00	2	$130.00
		Service charge	$270.60	1	$270.60
		MD audio-visual tax	$73.80	1	$73.80
		Subtotal			$10,331.90
	Meeting Room Rental				
		Breakout room/per room/per day	$350.00	2	$700.00
		General session	$550.00	2	$1,100.00
		Subtotal			$1,800.00
	Catering				
		Breakfast per person	$35.00	25 people/2 days	$1,750.00
		Service @ 22%	$385.00	1	$385.00
		Banquet sales @ 0.06	$105.00	1	$105.00
		State @ 0.06	$105.00	1	$105.00
		Lunch per person	$45.00	25 people/2 days	$2,250.00
		Service @ 22%	$495.00	1	$495.00
		Banquet sales @ 0.06	$135.00	1	$135.00
		State @ 0.06	$135.00	1	$135.00
		Dinner per person	$55.00	25 people/1 night	$1,375.00
		Service @ 22%	$305.50	1	$305.50
		Banquet sales @ 0.06	$82.50	1	$82.50
		State @ 0.06	$82.50	1	$82.50
		Subtotal			$7,205.50
Total Expenses					$31,664.24

APPENDIX N-I: USM NCLEX CONSULTANTS

EXPENSES		UNIT CHARGE	AMOUNT (#)	TOTAL	COMMENTS
Consultant					
	(Per consultant)/5 schools	$20,000.00	5	$100,000.00	
	Travel	$800.00	5	$4,000.00	
	Hotel				
	155 + 9.30 + 10.85 per person/per night	$175.15	15	$2,627.25	3 nights per consultant
	Per diem	$47.00	45	$2,115.00	
Preparation					
	Survey of each school				
	Design	$500.00	1	$500.00	
	Measure (online)	$150.00	1	$150.00	
	Report development	$200.00	1	$200.00	
TOTAL				**$109,592.25**	

APPENDICES

SIMULATION FACILITIES

APPENDIX S–A: MEDICAL SIMULATION UTILIZATION, INVENTORY, AND NEEDS ASSESSMENT

Note: The Sim Facilities Survey comprises 19 questions on simulation use and needs at responding institutions. For brevity and ease of understanding, the questions and responses replicated here do not contain answers to several sub-questions in each of the 19 categories.

For instance, in Question 6—regarding the availability and use of standardized patients (SPs)—the respondents were asked whether the SPs are paid or are volunteers, and whether they're on-site or available through other facilities. On Question 9—regarding the availability and use of high-fidelity manikins—respondents were asked whether the manikins are owned or leased and, again, whether they're available on-site or through other facilities.

The full Sim Facilities Survey and responses are available upon request.

Simulation Facilities Survey Respondents

Jan 24, 2018 02:13 PM	Denyce Watties-Daniels	Director, Simulation and Learning Resource Centers	Coppin State University
Jan 24, 2018 12:31 PM	Tara Ryan	Clinical Assistant Professor	Towson University
Jan 22, 2018 11:42 AM	Mary Pat Ulicny	Clinical Simulation Lab Director	UMSON USG Campus
Dec 15, 2017 02:50 PM	Beth Smolko	Director, PA Program	Frostburg State University
Dec 15, 2017 01:20 PM	Amy L. Daniels	Director, Clinical Simulation Lab	University of Maryland School of Nursing
Dec 15, 2017 09:29 AM	Heather Gable	Chair/Associate Professor	Frostburg State University
Dec 14, 2017 06:55 PM	Rena Boss-Victoria	Chair, Department of Nursing	Bowie State University
Dec 10, 2017 05:21 PM	Lisa A. Seldomridge	Director of Graduate & 2nd Degree Nursing Programs; Co-Director, Henson Medical Simulation Center	Salisbury University
Dec 04, 2017 09:46 AM	Regina Donovan Twigg	Clinical Associate Professor & Program Coordinator	Towson

QUESTION 1: Describe the mission and focus of medical simulation at your institution.

RESPONDENT 1

The Simulation Center is designed to support and augment the learning of students in the College of Health Professions. Students practicing in the CHP Simulation Center have extraordinary opportunities to indulge in a "real world" hospital environment, while applying quality, evidence-based, and safe patient care in a variety of settings before they treat real patients. Students sharpen their clinical skills using high-fidelity patient simulators with cutting-edge technology, under the direct guidance of the exceptional and experienced College of Health Professions faculty.

RESPONDENT 2

The mission of the Simulation Center of the Nursing Skills and Technology Center is to prepare students for professional nursing practice through the promotion of quality, safety, and evidence-based knowledge. The Simulation Center enhances student transition into their professional role through an experiential approach, including immersive technology, high-fidelity simulation learning, and interprofessional learning opportunities. The Simulation Center assists students to develop and refine the cognitive, affective, and psychomotor skills needed to improve their delivery of patient care, which fosters positive health care outcomes.

RESPONDENT 3

As a leader in Simulation, the UMSON integrates experiential learning into the full spectrum of nursing education, research, and practice, with a focus on patient safety, and also ensures optimal patient outcomes.

RESPONDENT 4

To provide an opportunity for physician assistant students to learn management and critical thinking skills regarding common practice issues in a safe and controlled environment.

RESPONDENT 5

The University of Maryland School of Nursing Clinical Simulation Laboratory & Standardized Patient Program integrate experiential learning into the full spectrum of nursing education, research, and practice to ensure optimum outcomes. Our vision is to fully integrate clinical simulation as a transformative learning strategy that ensures patient safety and facilitates optimum patient outcomes.

RESPONDENT 6

To provide an opportunity for advanced practice nurses to learn management and critical thinking skills regarding common practice issues in a safe and controlled environment.

RESPONDENT 7

Enhancement of clinical reasoning and transition into practice.

RESPONDENT 8

The mission of the Richard A. Henson Medical Simulation Center is to provide education, promote quality and patient safety, stimulate research and scholarship, and integrate evidence into clinical practice through the provision of invaluable simulation experiences for Salisbury University health professions students and area health care professionals.

RESPONDENT 9

To provided realistic simulations to help prepare our students to meet the complexity of the health care industry.

QUESTION 2: Which academic programs use simulation services at your institution?

RESPONDENT 1

Undergraduate and graduate nursing programs

RESPONDENT 2

Nursing and Occupational Therapy

RESPONDENT 3

Traditional undergraduate BSN students; plan for FNP students in fall of 2018

RESPONDENT 4

PA and NP programs—Advanced health assessment and diagnostic reasoning across the lifespan

RESPONDENT 5

Bachelors of Science in Nursing; Clinical Nurse Leader Program; RN-to-BSN program; Doctorate of Nursing Practice programs

RESPONDENT 6

Advanced health assessment and diagnostic reasoning across the lifespan, primary care across the lifespan, and women's health across the lifespan

RESPONDENT 7

Nursing—Traditional, Accelerated, RN/BSN, MS

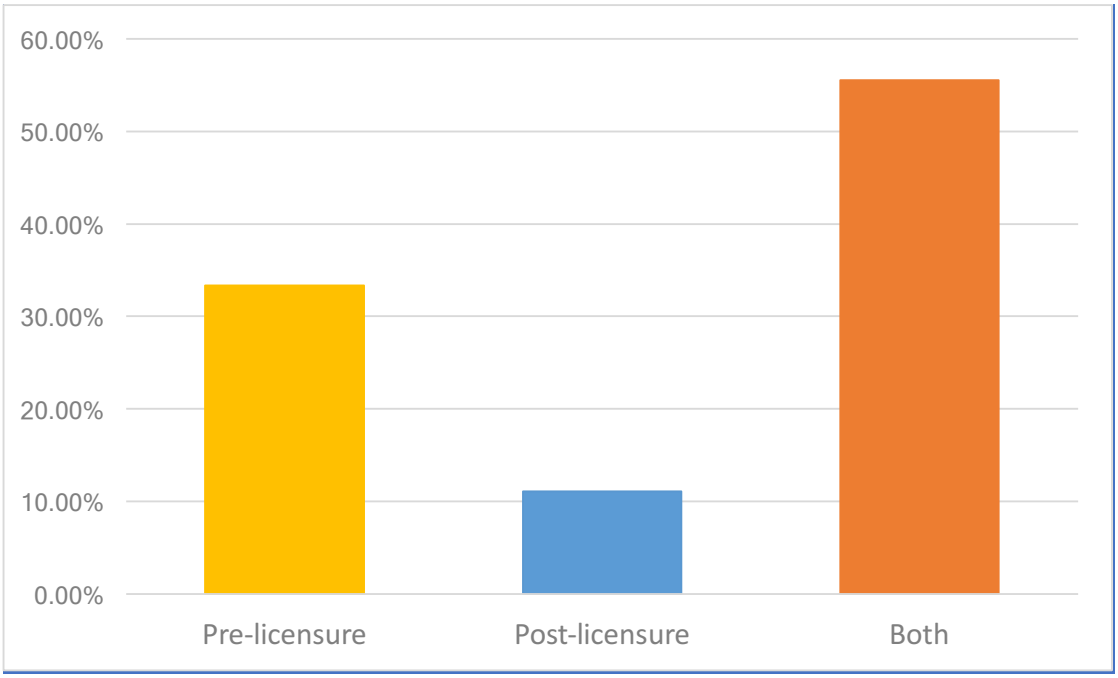
RESPONDENT 8

Undergraduate—nursing, respiratory therapy, math; Graduate—nursing, applied health physiology

RESPONDENT 9

All clinical courses

QUESTION 3: Which career level classification best fits your simulation center's target learner?



Career-Level Classification	
Pre-licensure	3 of 9
Post-licensure	1 of 9
Both	5 of 9

QUESTION 4: Does your simulation center have a specific simulation accreditation? If so, which organization(s) accredit your simulation program?

RESPONDENT 1

No, we are not accredited by any one organization or body.

RESPONDENT 2

No.

RESPONDENT 3

The USG CSL program at the USG campus is not currently accredited through the certifying body (SSH).

RESPONDENT 4

Not applicable—TBD.

RESPONDENT 5

Yes—Society for Simulation in Healthcare.

RESPONDENT 6

No.

RESPONDENT 7

Pending—Initial Application 2018.

RESPONDENT 8

No.

RESPONDENT 9

Not at this time; however, we adhere to the INACSL best practice standards, as well as the NCSBN.

QUESTION 5: Do your simulation center staff/faculty have—or are they in the process of obtaining—individual certification(s) in simulation? If so, what certifications do they have and what organizations provide them?

RESPONDENT 1

Yes, the Director has the goal of earning CHSE certification.

RESPONDENT 2

No.

RESPONDENT 3

The CSL Director and CSL Coordinator currently have a certificate in nursing education, the Certified Nurse Educator (CNE), which is granted through the NLN. The CSL Coordinator is a Certified Healthcare Simulation Educator (CHSE), a credential granted by the Society for Simulation in Healthcare.

RESPONDENT 4

Not applicable—TBD.

RESONDENT 5

Yes—Certified Healthcare Simulation Educator (CHSE), through the Society of Simulation in Healthcare.

RESPONDENT 6

Currently Simulation II Educator through Maryland Clinical Simulation Resource Consortium and completed the University of Maryland's simulation educator's training.

RESPONDENT 7

Simulation Lab Coordinator and Lab/Faculty personnel are in the process of obtaining CHSE certification.

RESPONDENT 8

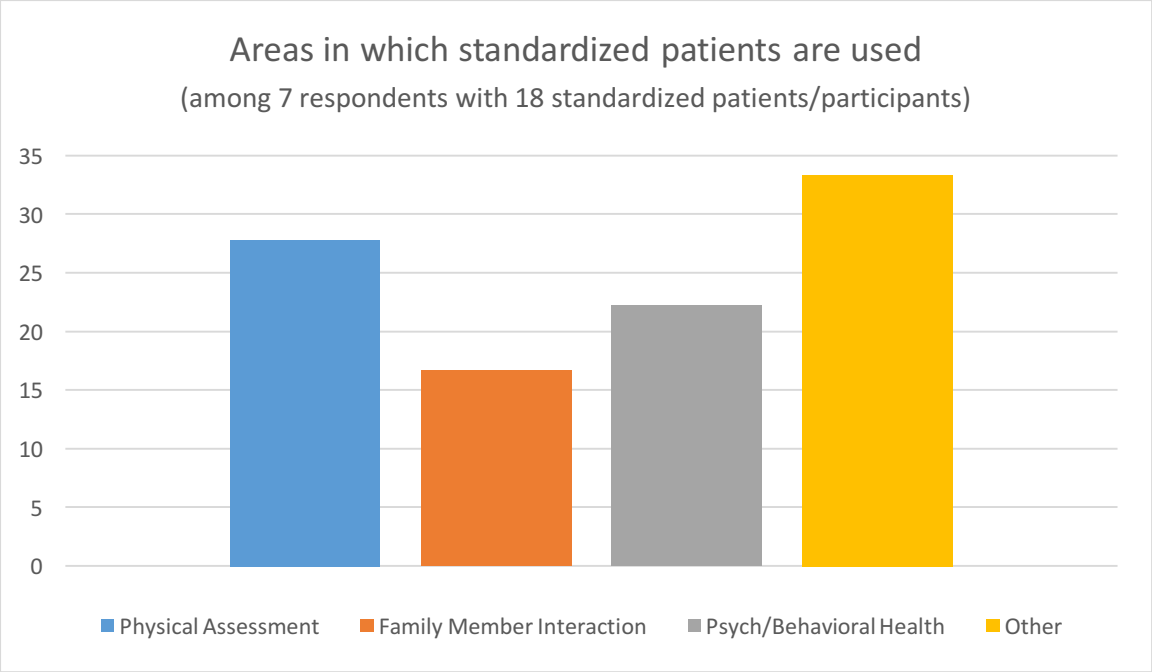
In planning phase for pursuit of accreditation from SSIH.

RESPONDENT 9

We may look for SSIH certification in the future.

QUESTION 6: Are standardized patients/participants[1] currently available and in what simulation content areas do you use them?

Currently Available	
Yes	87.5%
No	12.5%



Needs Associated With Standardized Patients

RESPONSES

SPs need training and guidance in simulation participation. In addition, educators need direction on how to hire and process professional SPs through the UM contract employee system.

SPs are used in NUR 485 Senior Practicum End of Life (EOL Sim).

If budget allows, future plans would include incorporating the use of SPs for Physical Assessment and Community.

SPs categorized as "other" also take part in hybrid simulations.

We anticipate using standardized patients for physical assessment in the PA program.

Plan to use standardized patients in some scenarios; simulation lab is not functional at this time, and program is being developed.

[1] **Standardized Patients/Participants:** Standardized patients/participants are individuals trained to portray patients, family members, or others to allow students to practice physical exam skills, history-taking skills, communication skills, and other exercises.

Recruitment, training, re-training, script development and refinement, instruction in debriefing, budget to cover payment for SP services.

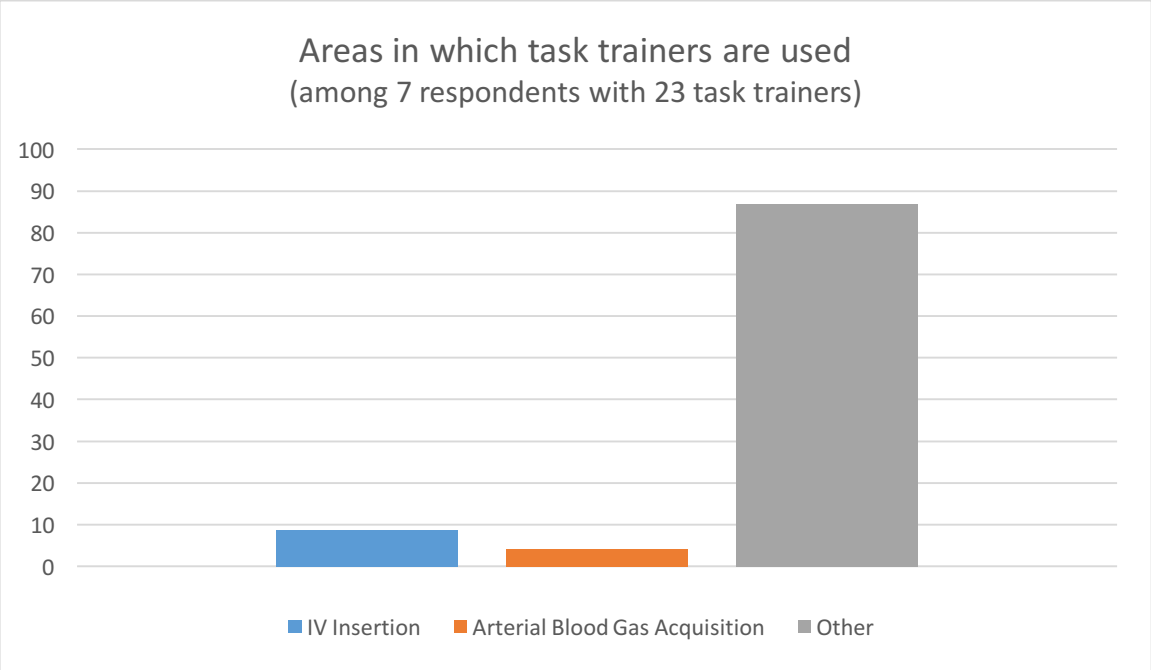
We are looking to expand the use of standardized patients by reaching out to other departments on campus and within USM.

Specifically, we need funding to support the hiring and maintenance of a standardized patient program.

We need to incorporate SPs into our health assessment, mental health, community, and senior practicum simulations.

QUESTION 7: Are task trainers[2] currently available and in what content areas do you use them?

Currently Available	
Yes	87.5%
No	12.5%



Needs Associated With Task Trainers

RESPONSES

The CSL currently has multiple task trainers that represent a part or region of the human body. Currently we have task trainers that mimic IV/indwelling catheter care, Foley (gender-specific) catheter care, nasogastric insertion care, tracheostomy care, and stoma care. These trainers are used to support procedural skills training and are also used as an adjunct to other educational strategies and learning technologies—and may also be integrated into simulated activities.

[2] **Task Trainer:** Task trainers are task-specific models (anatomical or non-anatomical) that allow repeated practice of a specific psychomotor skill, task, procedure, or anatomic orientation through repetition and instructor feedback.

We plan to use task trainers in the PA program in areas such as suturing, biopsies, pelvic examination, prostate exam, examination of eyes and ears, etc. These have been budgeted for purchase.

Task trainers planned for purchase: suturing, biopsies, pelvic examination, examination of eyes & ears, prostate examinations.

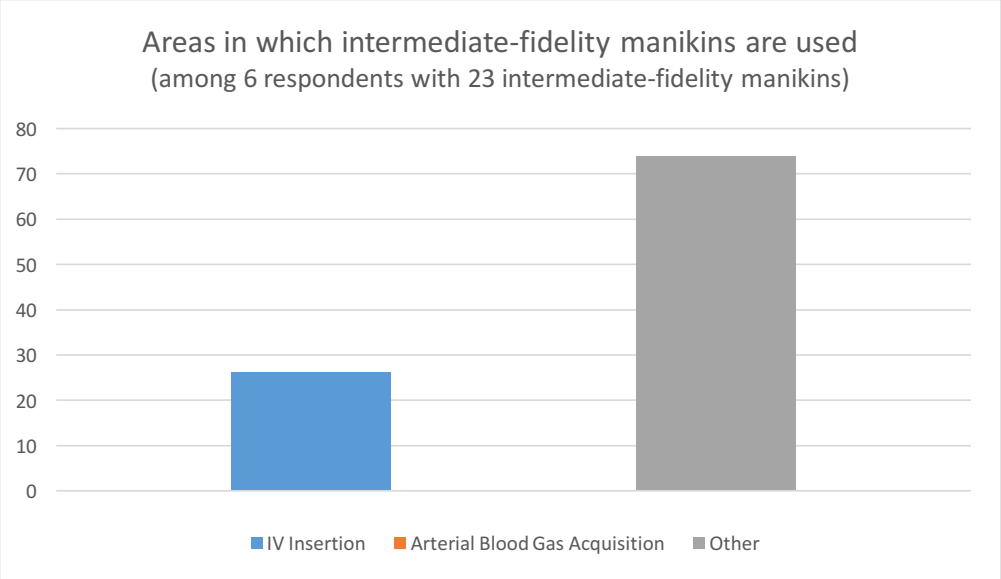
A variety of task trainers may be needed depending on the learning experience. In the category of "other," task trainers include CPR manikins (adult and infant), trach care, suctioning, N/G tube insertion, endotracheal intubation, and injection pads, among others. They are used when the goal is learning/perfecting a psychomotor skill. They are also used in conjunction with simulation scenarios with high-fidelity human patient simulators to reduce wear-and-tear on these very expensive simulators.

Specifically, we are using skills training products from Laerdal with the use of both low- and intermediate-fidelity simulators in addition to task trainers.

We need more IV insertion arms, Chester Chest™ for central line access devices.

QUESTION 8: Are intermediate-fidelity manikins[3] currently available and in what content areas to you use them?

Currently Available	
Yes	75%
No	25%



[3] **Patient Simulator (Intermediate Fidelity):** Intermediate-fidelity patient simulators, operated by a trained individual, are partial- or full-body manikins providing a physical presence on which to practice interventions. These simulators may interact with the user in limited ways, but the bulk of the responses are provided by the trained operator.

Needs Associated With Intermediate-Fidelity Manikins

RESPONSES

The UMSON CSL at the USG campus has several intermediate-fidelity manikins that incorporate the following levels of realism: physical fidelity and equipment fidelity that varies in the level of dimension, attributes, and culture as it relates to interactions that students encounter in the real-world clinical setting. The fidelity choice of the manikin is related to the simulation scenario objectives.

Intermediate-fidelity manikins are being considered for purchase to serve the PA program.

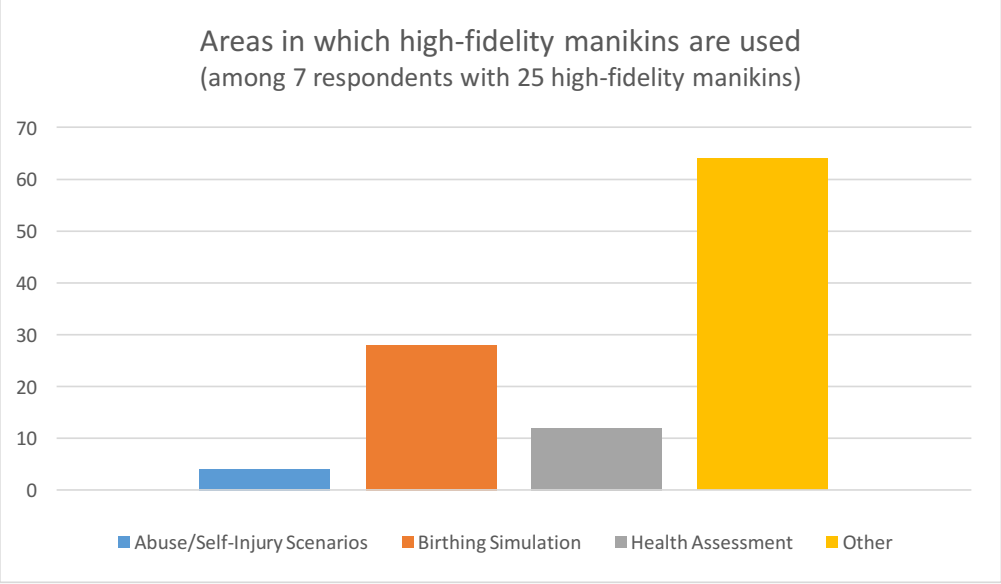
All intermediate-fidelity manikins are 10+ years old and need replacement. These manikins are used for the purposes of fundamental nursing training in the BSN and CNL programs.

We need additional supplies and equipment to enhance the clinical experience. Specifically: 1. barcode scanning medication dispensing system to mimic the hospital experience; 2. barcode system for patient identification; 3. tablets for each of the simulators to support electronic health records at the bedside; 4. patient care scenarios.

We have four Nursing Annes and four Nursing Kellys that we use for our Fundamentals courses. They are equipped with the ability to do many tasks, such as suction, indwelling catheter insertion, bathing, turning, etc.

QUESTION 9: Are high-fidelity manikins[4] currently available and in what content areas do you use them?

Currently Available	
Yes	100%
No	0%



[4] **Patient Simulator (High Fidelity):** High-fidelity patient simulators are partial- or full-body manikins, operated by a trained individual, that are capable of mimicking a patient's direct, real-time physiological reaction to student-initiated physical and/or simulated pharmacological interventions and therapies.

Needs Associated With High-Fidelity Manikins

RESPONSES

Need assistance with programing the manikins. Need support in maintaining manikins. Many of our manikins are old and no longer covered under warranty or supported by the vendors. The technology is outdated and upgrades are no longer available.

In need of warranty coverage.

The UMSON CSL at the USG campus has access to several high-fidelity manikins, which most closely resemble realism, showing physiological changes related to case, movement, animation, and progression. These manikins are involved in maternal, pediatric, fundamentals, medical-surgical, critical care, and senior practicum encounters.

The Frostburg NP program has high-fidelity adult mannequins, which will be used for simulation of office emergency situations, including myocardial infarction, respiratory distress, cardiac arrhythmias, syncope, and shock. Pediatric high-fidelity mannequins will be used for simulation of office emergency situations, including croup, epiglottitis, respiratory distress, congenital heart decompensation, dehydration, and shock. The Frostburg PA program plans to purchase—and to have faculty trained and certified in the use of—high-fidelity mannequins, as well.

Need additional manikin to accommodate increasing volume of simulation across all programs.

Need for manikins that can respond to mechanical ventilation or to a ventilation simulator.

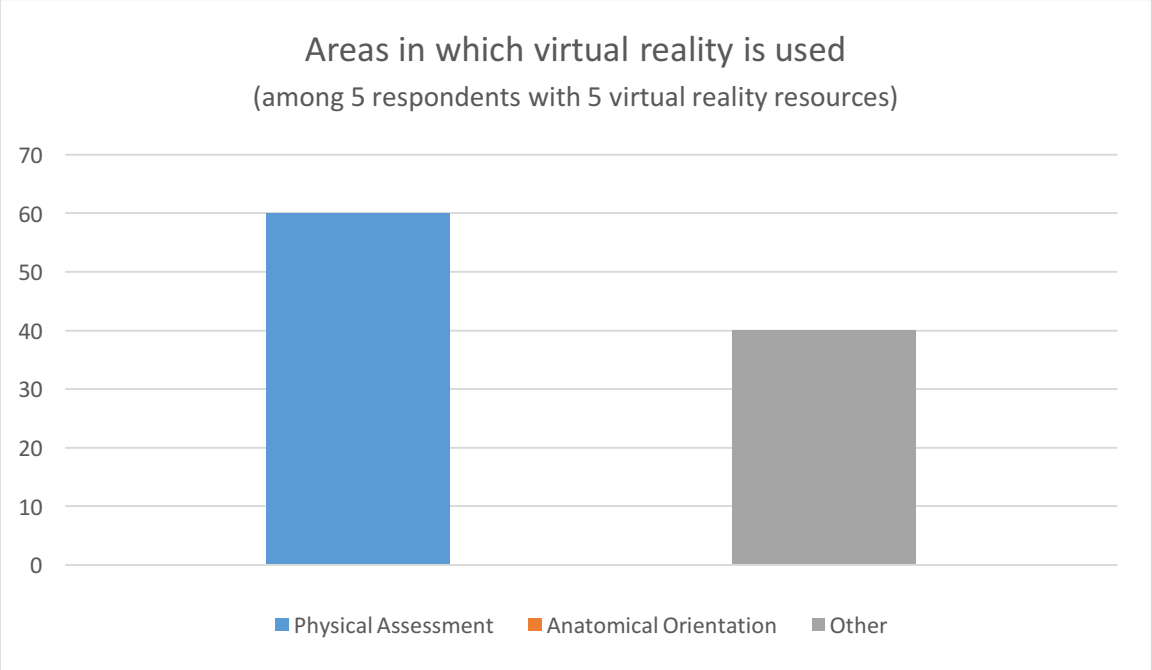
We need additional supplies and equipment to enhance the clinical experience. Specifically: 1. Barcode scanning medication dispensing system to mimic the hospital experience; 2. Barcode system for patient identification; 3. Tablets for each of the simulators to support EHRs at the bedside; 4. Patient care scenarios.

At the present time, we only have a sim junior. We badly need a sim baby, birthing mother, and adult sim man.

QUESTION 10: Is virtual reality (with and without haptics)[5] available and in what content areas do you use it?

Currently Available	
Yes	57.1%
No	42.9%

[5] **Virtual Reality/Haptic Simulators:** Virtual reality (VR) simulators facilitate student-patient interactions. The simulator offers a patient's physical representation through the use of sensing mechanisms that provide the student the VR experience. In models that include haptic feedback, the student is given the illusion that he/she is in physical contact with the simulated patient through sensory feedback.



Needs Associated With Virtual Reality

RESPONSES

Need more faculty to embrace the technology and realize its potential.

The health assessment course currently uses a virtual reality simulation learning resource as an adjunct platform integrated with this course as students progress through the semester. The students work with the same virtual patient for the entire semester.

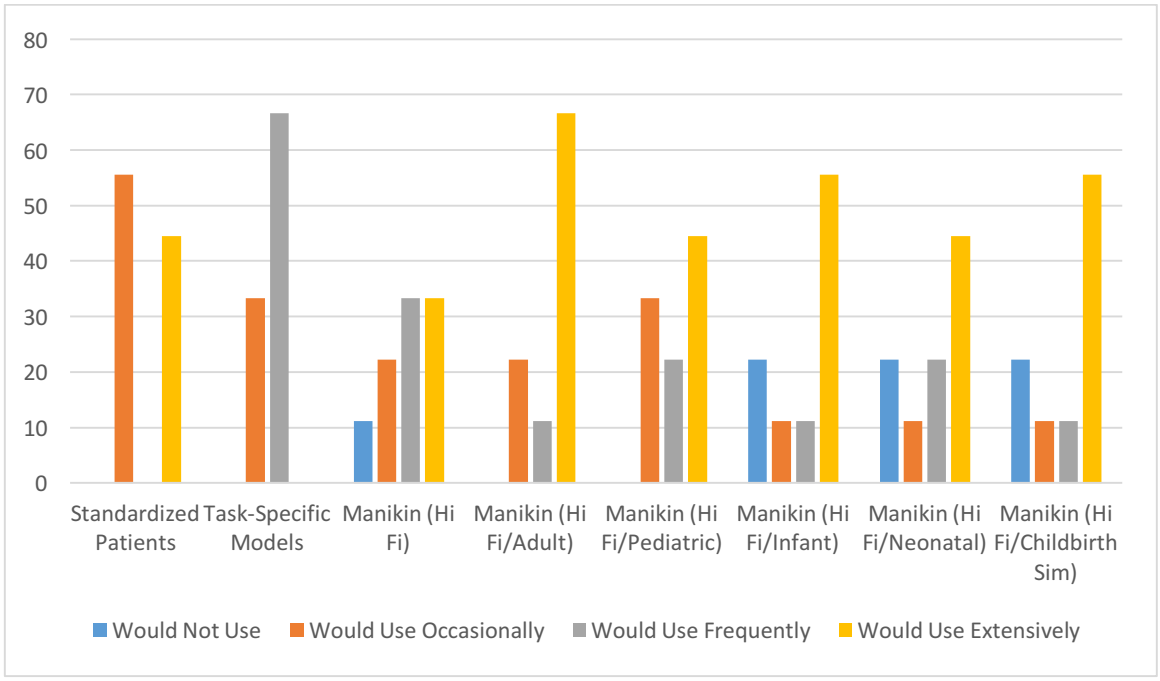
Need to integrate more virtual simulation to provide alternative clinical experiences in the absence or limitation of clinical placement.

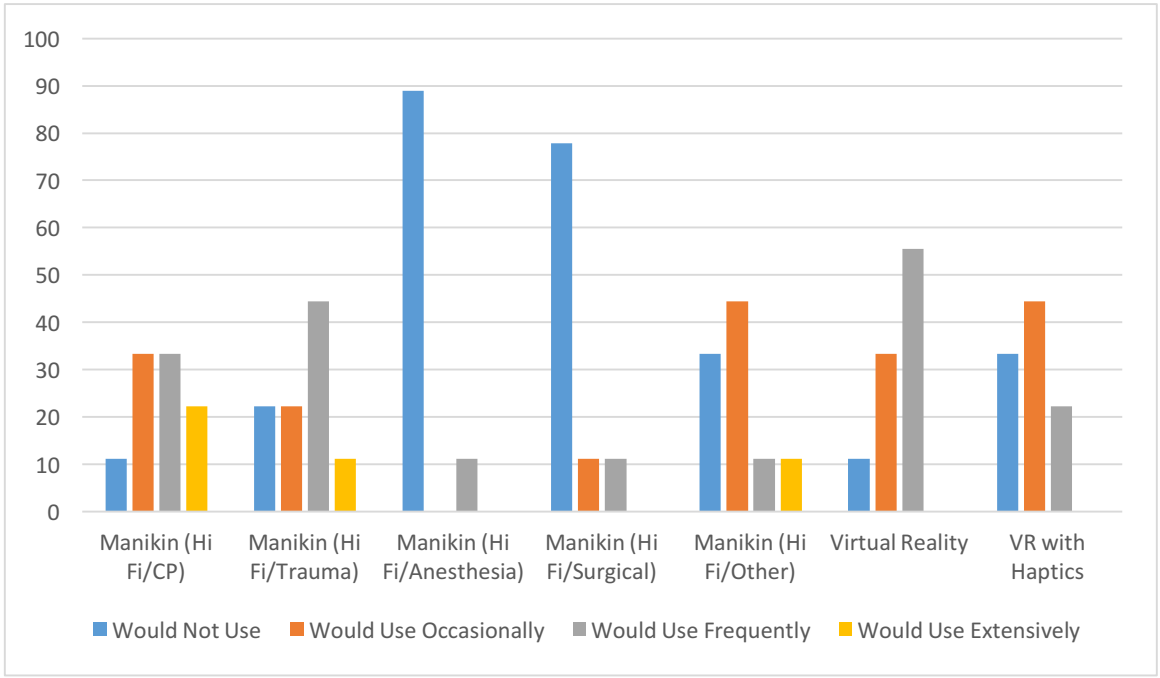
VR will be used for physical assessment and diagnostic testing.

VR could be extremely useful in teaching physical assessment, anatomic orientation, as well as specific medical interventions.

We need additional funding to support purchasing the software—e.g., vSim—and tablets to allow students to have full access to the virtual simulation.

QUESTION 11: Indicate the desired or anticipated needs in simulation training for your organization.

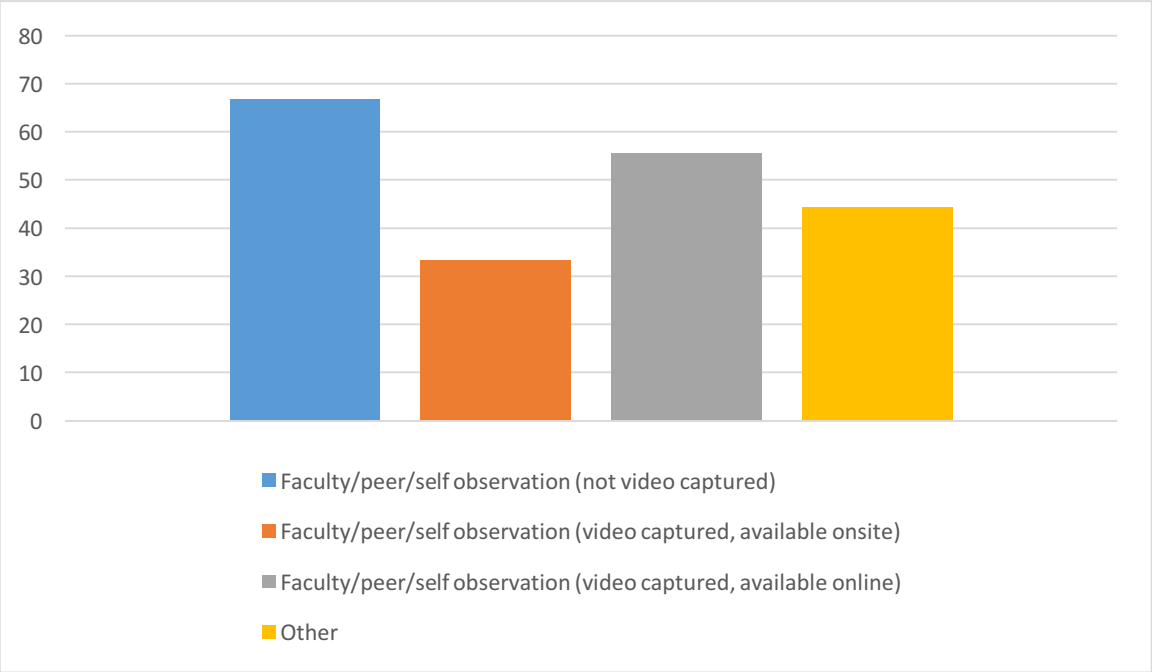




RESPONSE

Needs: System to teach telemedicine and inventory system where RFID is integrated into simulation.

QUESTION 12: How do your students receive feedback?



RESPONSES

We have the video capabilities and often record; however, the recordings are not played during the debriefing process.

PA program in development—no students at this time. We plan to deliver feedback to students via faculty/peer/self-observations of their performance (video-captured and available through a secure website).

Students would receive feedback through faculty/peer and self-observations, video-captured and available through a secure website.

Standardized patients provide feedback to our students. Post-simulation debriefing is conducted both with and without review of videos.

QUESTION 13: Have your faculty received training specifically in providing students feedback/debriefing?

Faculty Receive Training	
Yes	88.9%
No	11.1%

RESPONSES

Yes, Debriefing for Meaningful Learning.

Laerdal Simulation Training and Personal Mentor/Apprenticeship. Barriers include financial support and finding coverage for faculty who need to be off campus for conferences, workshops, etc.

Yes, CSL Director and Coordinator are part of the MCSRC Simulation Education Learning Program; CSL Director has had formal training at the Center for Medical Simulation at Harvard. Barriers: Time-intensive, expense for formal training that is not grant-funded.

Yes—Center for Medical Simulation.

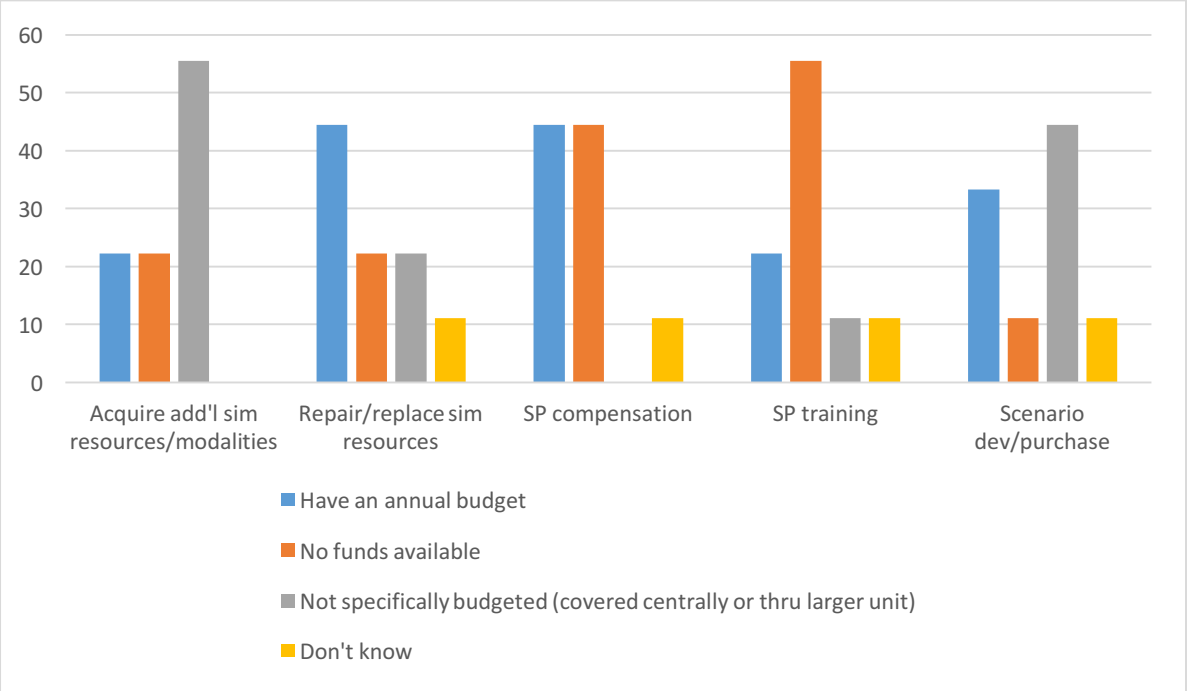
Feedback/debriefing provided through specific feedback and debriefing trainings that were attended within the past year.

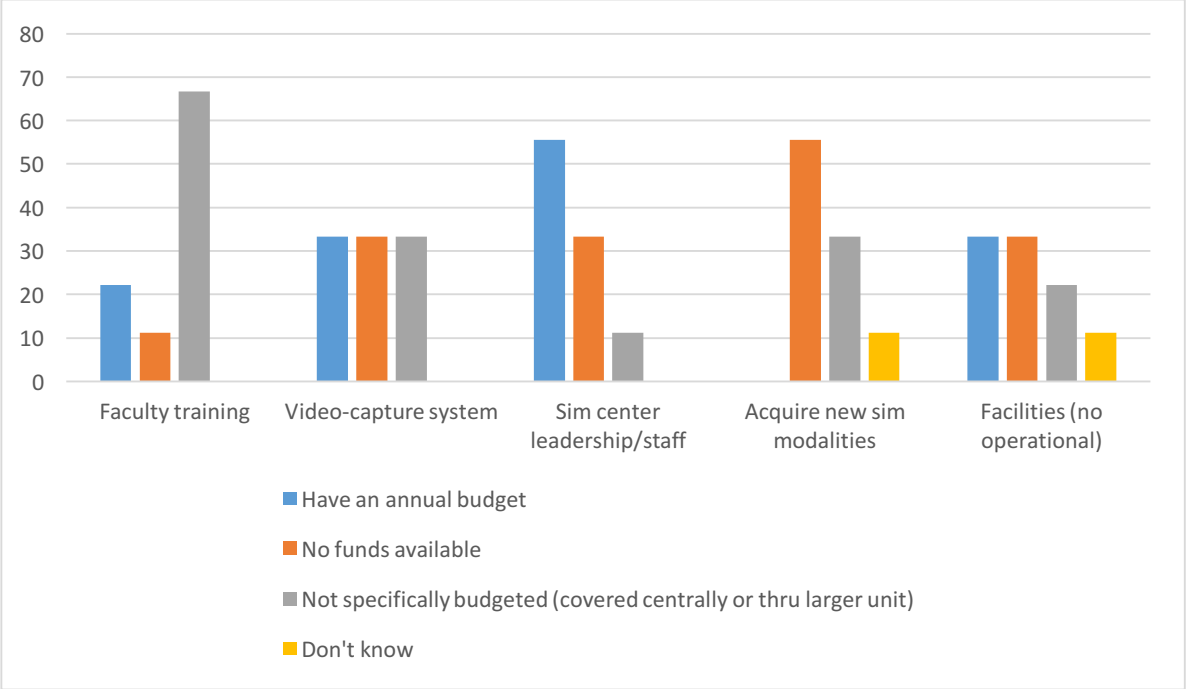
One faculty member has attended debriefing workshops offered by the Maryland Clinical Simulation Resource Center; another faculty member has applied for same. There are plans to have MCSRC come to campus to provide a 1-day debriefing workshop at our Sim Center.

Three faculty received training from the Maryland Clinical Simulation Resource Consortium, funded by MHEC. These faculty were trained and provide training to other faculty (train the trainer).

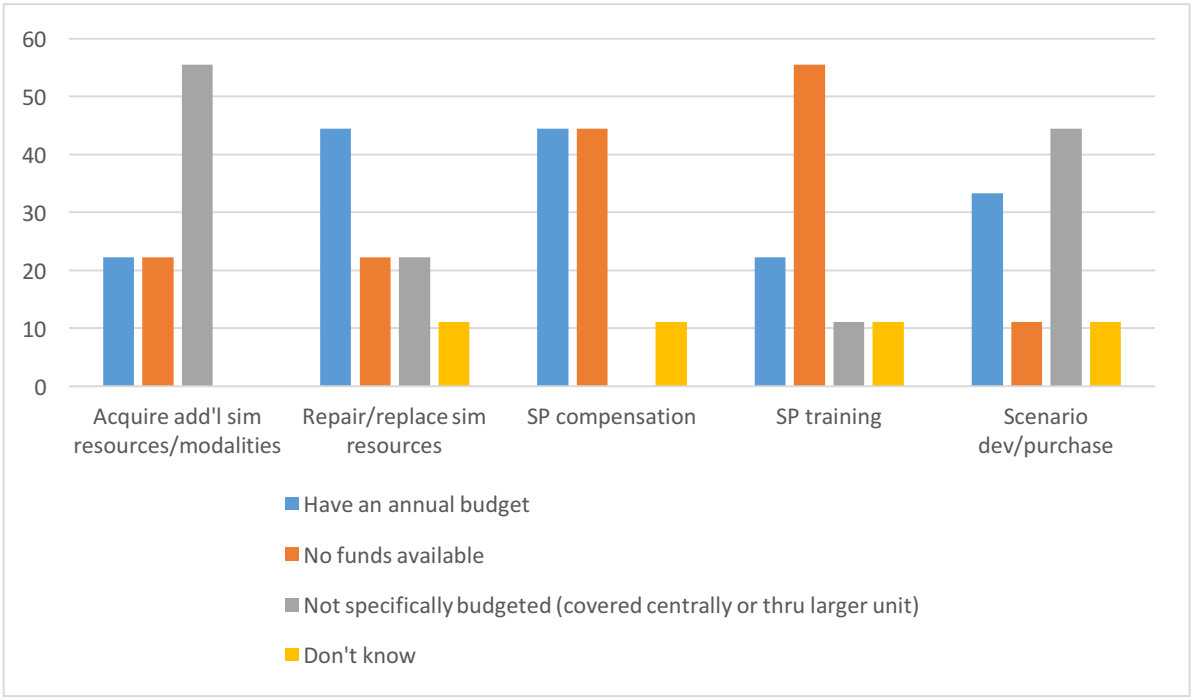
Yes, via Drexel and Institute for Simulation Educators.

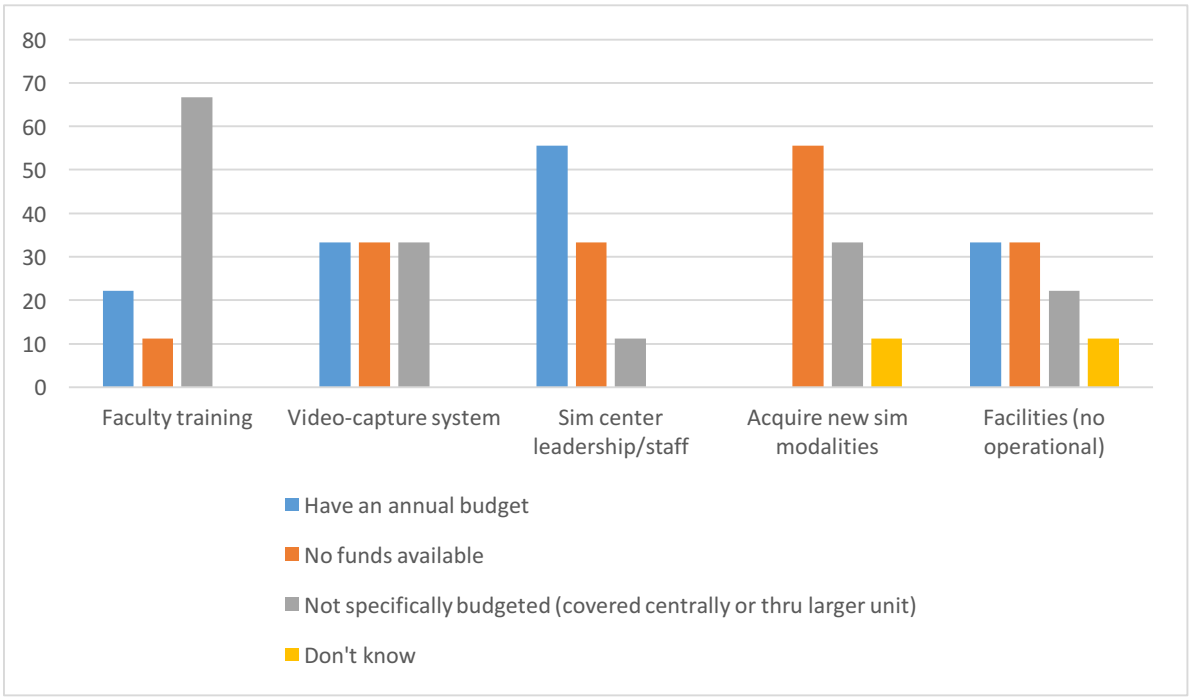
QUESTION 14: Indicate your budget availability for the following.





QUESTION 15: For respondents with an annual budget, indicate your budget to the nearest $1,000.





QUESTION 16: What do you consider your organization's greatest strength in terms of health care simulation?

RESPONDENT 1

We have several enthusiastic faculty who support the use of simulation. We have a Dean and Program Chair who support the use of simulation in our programs. We have a well-trained Director who facilitates the use of simulation in courses.

RESPONDENT 2

Up-to-date equipment, knowledgeable faculty and willing to learn.

RESPONDENT 3

Although simulation is effective for teaching skills and knowledge and for learner satisfaction, the relationship between the simulation modality and learning outcomes is still needed as it relates to patient care and improved patient outcomes.

RESPONDENT 4

PA Program in development—TBD.

RESPONDENT 5

We provide a robust simulation program for all academic programs within the school, aligned with standards of best practice in simulation as set by INACSL and SSH.

RESPONDENT 6

Not in a position to determine at this time.

RESPONDENT 7

Highly competent, creative, and enthusiastic simulation staff.

RESPONDENT 8

Acquisition of new, state-of-the-art simulation modalities within 2017–18.

RESPONDENT 9

Faculty creativity and their understanding of simulation.

QUESTION 17: What do you consider your greatest unmet need in terms of health care simulation?

RESPONDENT 1

Continued resources to repair and replace old and outdated technology.

RESPONDENT 2

Simulation engineer position.

RESPONDENT 3

The greatest unmet need is seeking the best way to evaluate simulation strategies for their overall effectiveness, and synthesize the outcomes as they relate to curricular outcomes in undergraduate and graduate programs.

RESPONDENT 4

PA Program in development—TBD.

RESPONDENT 5

Greatest unmet need at this time are resources to support program evaluation and further research of best practices.

RESPONDENT 6

Not in a position to determine at this time.

RESPONDENT 7

Lack of operational/annual budget, meaning we're heavily reliant on external funding for all aspects of sim center operation.

RESPONDENT 8

Confirmation of an annual budget to support simulation center leadership and lab faculty and additional simulation resources/modalities.

RESPONDENT 9

Need for technology, faculty support, and training and resources.

QUESTION 18: Would you use resources available in a mobile sim lab if they met a high-need area for you?

RESPONSES

Yes.

Yes.

Yes, absolutely, as we have many resources for our students, but would be open to sharing in this learning opportunity to supplement other learning strategies related to simulation technology.

We would consider using a mobile sim lab.

Absolutely.

Most likely not.

No.

Yes, skill-building of practicing post-licensure nurses in the immediate surrounding areas has been presented as a need for clinical education.

Absolutely.

QUESTION 19: What else would you like to share with the Sim Facilities Action Group?

RESPONSES

The needs and use of simulation vary among programs in our state, and are not necessarily dictated by size or program emphasis. I would like to see the opportunity for programs to share resources and to collaborate on simulation experiences. I teach in a pre-licensure and graduate nursing program. I would love to collaborate and offer interprofessional simulations with colleges/universities that have medical and allied health programs.

The UMSON CSL at the USG campus is currently working on a gap analysis to look at the current state of simulation within the clinical simulation program at this campus as it relates to the SSH required accreditation standards.

There is no place on the survey to indicate grant and other external funding support. Our need to offer revenue-generating options (because there is no dedicated annual budget currently) limits instructional time at the center for students. Staff are "homegrown"—very few people have academic and experiential preparation to run simulation centers, yet they are essential to the success of the sim center. Support for professional development opportunities is essential.

There are opportunities to develop curricular offerings to support the new and expanding industry of simulation education for both staff and faculty that we've wanted to pursue for years. Funding for our center has prohibited our ability to pursue these initiatives.

We need more funding to obtain certification for additional faculty in simulation.

Need for a budget to maintain and grow the simulation center at TU and USMH.

APPENDIX S–B: ESTIMATED IMPLEMENTATION BUDGET FOR THREE-PHASE SIMULATION RECOMMENDATIONS

PHASE 1—USM CENTER OF EXCELLENCE IN SIMULATION EDUCATION			
	Cost	Number	Total Cost
Director (salary and benefits)	$121,500	1	$121,500
Trainers (salary and benefits)	$94,500	2	$189,000
Participant travel, per diem, and honoraria	$400	90	$36,000
Hospitality	$225	6	$1,350
Operating	$20,000	1	$20,000
Marketing	$5,000	1	$5,000
Professional Development	$4,000	3	$12,000
Office Space Rental	$5,000	2	$10,000
Conferencing Space	$500	6	$3,000
Annual Personnel and Operating Expenses			**$397,850**
One-time Office Set-up	$30,000	1	$30,000
Simulation Education Center (see Phase 3, p. 90)	$750,000	1	$750,000
One-time Start-up Expenses			**$ 780,000**

Note: This budget includes annual support for a director and two trainers, as well as their associated professional development. It also includes funding for six workshops—serving 15 participants each—and office and conference space. One-time funding would be needed for office set-up and sim lab development.

PHASE 2—MOBILE SIM LAB			
	Cost	Number	Total Cost
Gas and Maintenance	$0.29	40,000	$11,600
Trainer	$94,500	1	$94,500
Trainer Travel Expenses	$400	18	$7,200
Operating	$30,000	1	$30,000
Annual Personnel and Operating Expenses			$143,300
Vehicle‡	$250,000	1	$250,000
Specialty Manikins†	$75,000	50	$3,750,000
One-time Start-up Expenses			$4,000,000

PHASE 3—SIM CENTER EXPANSION WITHIN USM			
	Cost	Number	Total Cost
Director: 1/2 salary and benefits (to be matched by local universities)	$65,250	2	$130,500
Tech Specialist	$94,500	2	$189,000
Annual Personnel and Operating Expense			$319,500
Purchase of Scenarios, Curriculum Development, and Assessments	$50,000	2	$100,000
Video Capture Systems (software, servers, cameras/mics)‡	$500,000	2	$1,000,000
Misc. Sim Equipment (IV pumps, beds, gas set-up, maintenance contracts, moulage, supplies/supply organization, EMR, etc.)†	$300,000	2	$ 600,000
Manikins (purchase or rental)†	$ 75,000	20	$ 1,500,000
One-time Start-up Expenses			$ 3,200,000

Note: This budget assumes significant support from the universities expected to participate. That is, the participating universities would be expected to contribute 50 percent of the director's salary and benefits, disposable supplies, space and props for different types of clinical settings, salaries for standardized patients, utilities, IT, etc.

‡ Estimated replacement cycle—every 6 years
† Estimated replacement cycle—every 8 years

APPENDIX S-C: LIST OF DEANS AND SIM COORDINATORS FROM THE MARYLAND CLINICAL SIMULATION RESOURCE CONSORTIUM

Institution Type	Pre-licensure School	Dean	Job Title	SIM Coordinator
Community College	Allegany College	Debbie Costello	Program Director	Rick Cooper
Community College	Anne Arundel Community College	Beth Anne Batturs	Director of Nursing and Healthcare Initiatives	Myra Dennis
Community College	Baltimore City Community College	Deirdre Stokes	Nursing Program Coordinator	Amber Bowers
University	Bowie State University	Rena Boss-Victoria	Chair of Nursing	Debra Coppedge
Community College	Carroll Community College	Nancy Perry	Chief Academic Officer	Tammy Schwaab
Community College	Community College Baltimore County–Catonsville	Elizabeth Webster	Director of Nursing-Catonsville	Coleman Mettee
Community College	Community College Baltimore County–Essex	Mary Kay DeMarco	Director of Nursing-Essex	Susan Bunting
Community College	Cecil Community College	Christy Dryer	Dean of Nursing and Health Professions	Lauren Dawson
Community College	Chesapeake College	Judith Stetson	Director of Nursing	Crystel Farina
Community College	College of Southern Maryland	Laura Polk	Department Chair	Linda Goodman
University	Coppin State University	Joan Tilghman	Associate Dean of Nursing	Denyce Watties-Daniels
Community College	Frederick Community College	Vanessa Lovato	Director of Nursing	Lisa Brandenburg
University	Frostburg State University	Heather Gable	Chair of Nursing	Jill Buterbaugh
Community College	Hagerstown Community College	Karen Hammond	Director of Nursing	Matthew Dorsey
Community College	Harford Community College	Laura Cianelli Preston	Dean of Nursing and Allied Health Professions	Cathy Sikora
Community College	Hood College	Carol Snapp	Director of Nursing	Marie Statler
Community College	Howard Community College	Deborah Smith	Chair of Nursing	Lana Thomas
University	Johns Hopkins University	Patricia Davidson	Dean of Nursing	Nancy Sullivan
Community College	Montgomery College	Monique Davis	Director of Nursing/Associate Dean	Rose Kronziah-Seme
University	Morgan State University	Maija Anderson	Director of Nursing	Pauline Aquil-Preston
University	Notre Dame of Maryland University	Kathy Wisser	Dean of Nursing	Amanda Henson; Deborah Naccarini
Community College	PG Community College	Barbara Engh	Interim Department Chair	Cassandra Hall
University	Salisbury University	Jeffrey Willey	Chair of Nursing	Deanna Schloemer
University	Stevenson University	Ellen Clayton	Chair of Nursing	Jeffrey L. Wells
University	Towson University	Hayley Mark	Chair of Nursing	Tara Ryan
University	Universities at Shady Grove	Rebecca Wiseman	Chair, UMSON @ Shady Grove	Mary Pat Ulicny
University	University of Maryland, Baltimore	Karen Kauffman	Chair and Associate Professor	Amy Daniels
University	Washington Adventist University	Cheryl Kisunzu	Interim Director of Nursing	Carelle Varona
Community College	Wor-Wic Community College	Brenda Mister	Department Head, Professor of Nursing	Dixie J. Sollazzo

APPENDICES

INTERPROFESSIONAL EDUCATION

APPENDIX I–A: INTERPROFESSIONAL EDUCATION ACTION GROUP SURVEY WITH RESPONSES

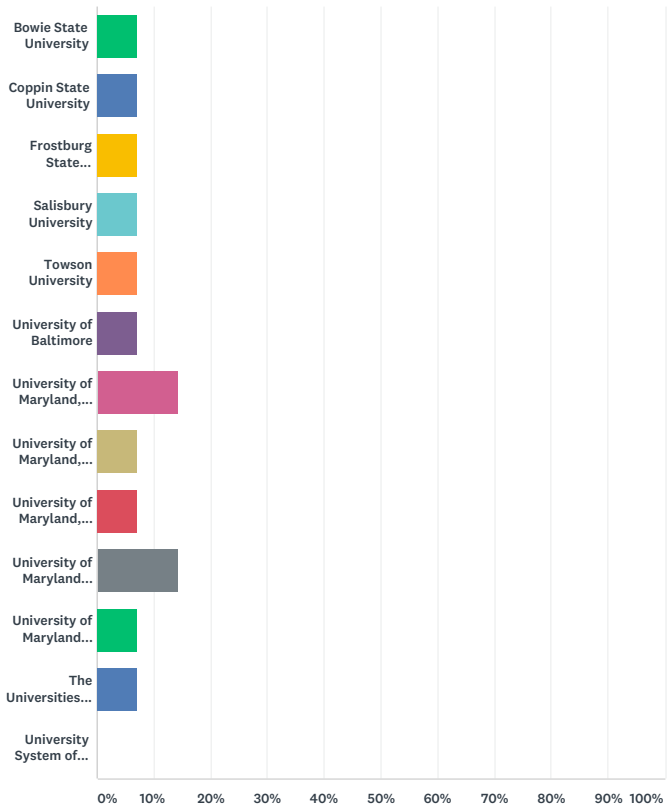
On the following page begins an excerpt of the Interprofessional Education Action Group survey, as completed by 11 of 12 USM institutions, as well as the Universities at Shady Grove. The survey, produced by SurveyMonkey, is lengthy—374 pages—given that several questions were asked about each discrete university-sponsored IPE activity.

The survey is therefore abridged to the first 20 questions, which all responding institutions could answer. The full survey is available upon request.

Interprofessional Education (IPE) Questionnaire - Survey Monkey

Q1 University completing this survey

Answered: 14 Skipped: 0

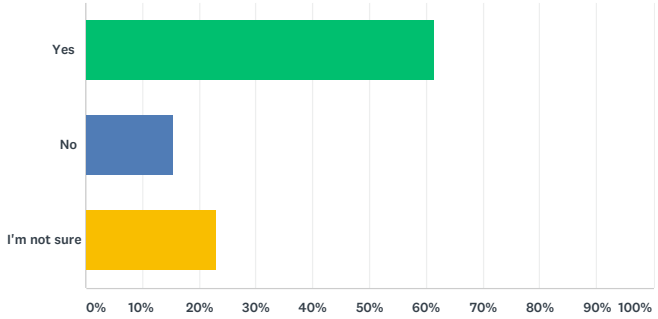


ANSWER CHOICES	RESPONSES	
Bowie State University	7.14%	1
Coppin State University	7.14%	1
Frostburg State Unniversity	7.14%	1
Salisbury University	7.14%	1
Towson University	7.14%	1
University of Baltimore	7.14%	1
University of Maryland, Baltimore	14.29%	2
University of Maryland, Baltimore County	7.14%	1
University of Maryland, College Park	7.14%	1
University of Maryland Eastern Shore	14.29%	2
University of Maryland University College	7.14%	1
The Universities at Shady Grove	7.14%	1
University System of Maryland at Hagerstown	0.00%	0
TOTAL		14

Interprofessional Education (IPE) Questionnaire - Survey Monkey

Q2 The literature defines IPE as, "when students from two or more professions learn about, from and with each other to enable effective collaboration and improve health outcomes" (WHO, 2010). Is this the definition that has been adopted at your institution?

Answered: 13 Skipped: 1

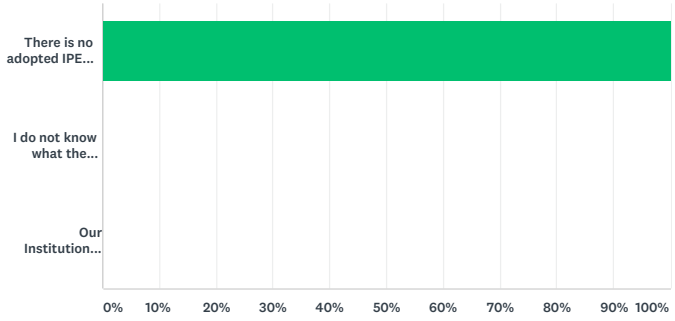


ANSWER CHOICES	RESPONSES	
Yes	61.54%	8
No	15.38%	2
I'm not sure	23.08%	3
TOTAL		13

Interprofessional Education (IPE) Questionnaire - Survey Monkey

Q3 Please provide the definition of IPE that is adopted at your institution.

Answered: 2 Skipped: 12



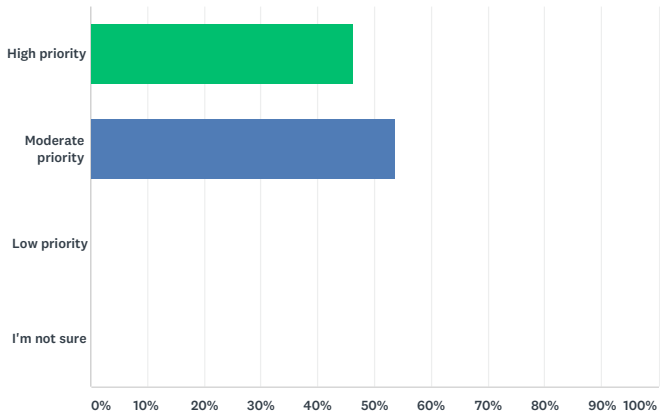
ANSWER CHOICES	RESPONSES	
There is no adopted IPE definition at our institution	100.00%	2
I do not know what the adopted IPE definition is at our institution	0.00%	0
Our Institution adopted IPE definition is	0.00%	0
TOTAL		2

#	OUR INSTITUTION ADOPTED IPE DEFINITION IS	DATE
	There are no responses.	

Interprofessional Education (IPE) Questionnaire - Survey Monkey

Q4 What level of priority is IPE at your institution?

Answered: 13 Skipped: 1

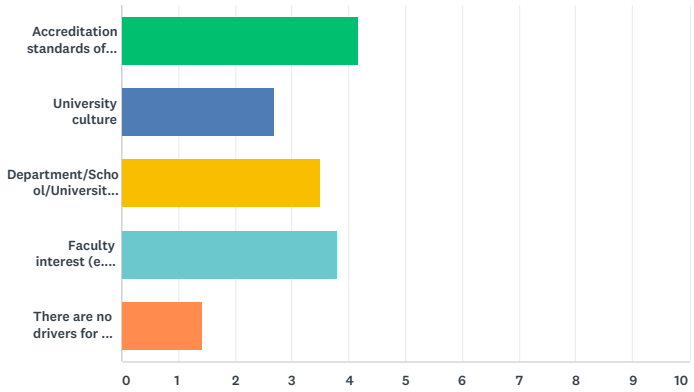


ANSWER CHOICES	RESPONSES	
High priority	46.15%	6
Moderate priority	53.85%	7
Low priority	0.00%	0
I'm not sure	0.00%	0
TOTAL		13

Interprofessional Education (IPE) Questionnaire - Survey Monkey

Q5 Please rank the factors that influence IPE at your institution (#1 being strongest influencing factor).

Answered: 13 Skipped: 1

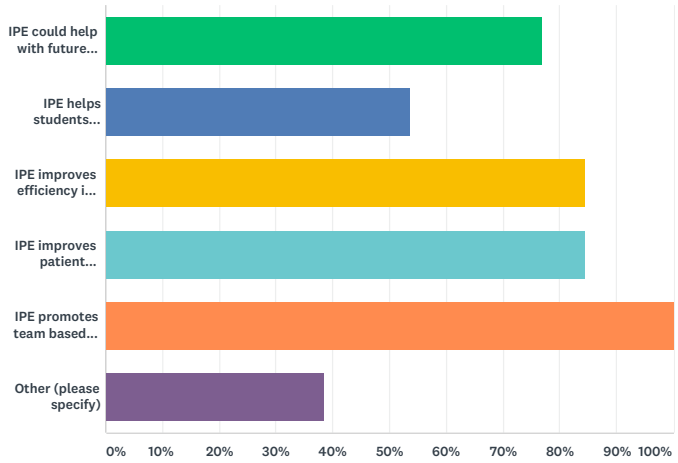


	1	2	3	4	5	TOTAL	SCORE
Accreditation standards of participating disciplines	58.33% 7	16.67% 2	8.33% 1	16.67% 2	0.00% 0	12	4.17
University culture	0.00% 0	30.00% 3	10.00% 1	60.00% 6	0.00% 0	10	2.70
Department/School/University support	16.67% 2	25.00% 3	50.00% 6	8.33% 1	0.00% 0	12	3.50
Faculty interest (e.g. desire to improve students' critical thinking through changes in pedagogical approach; to promote collaboration and scholarship across disciplines; etc)	30.00% 3	30.00% 3	30.00% 3	10.00% 1	0.00% 0	10	3.80
There are no drivers for IPE at our institution	0.00% 0	14.29% 1	0.00% 0	0.00% 0	85.71% 6	7	1.43

Interprofessional Education (IPE) Questionnaire - Survey Monkey

Q6 What are the perceived benefits of IPE at your institution? Check all that apply.

Answered: 13 Skipped: 1



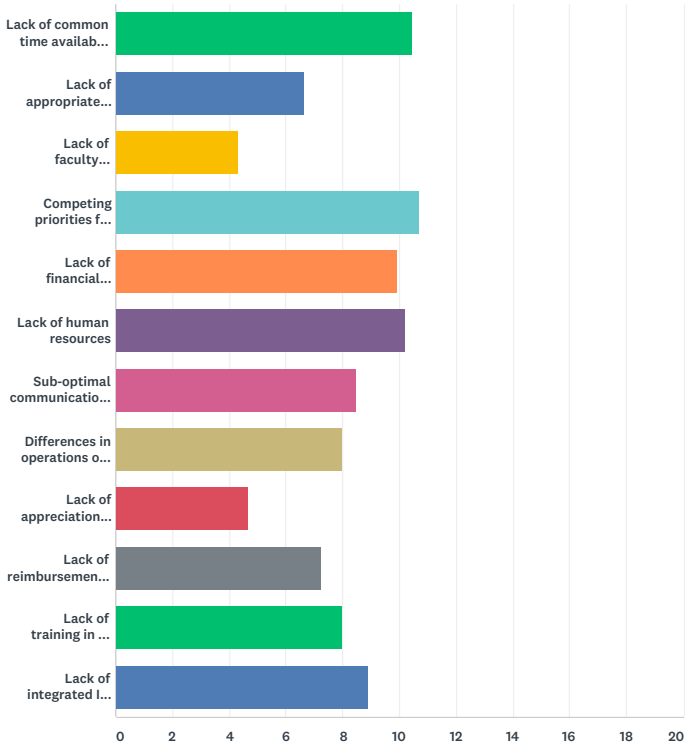
ANSWER CHOICES	RESPONSES	
IPE could help with future conflict resolution when health care professionals disagree on patient treatment options	76.92%	10
IPE helps students identify the limitations of their role within health care	53.85%	7
IPE improves efficiency in patient care	84.62%	11
IPE improves patient outcomes	84.62%	11
IPE promotes team based learning	100.00%	13
Other (please specify)	38.46%	5
Total Respondents: 13		

#	OTHER (PLEASE SPECIFY)	DATE
1	Faculty collaboration for research and scholarship Improves patient care and health outcomes through interprofessional practice Faculty experts serving as guest lecturers in a variety of disciplines Professional satisfaction and professional development Understand and appreciate the role of other health care professions Facilitate transition into real world inter-disciplinary practice	1/17/2018 2:34 PM
2	1. Prepares students for workplace readiness 2. Helps students develop professional identities 3. Help students appreciate perspectives of other disciplines 4. Increases and deepens faculty engagement across disciplines/institutions	1/2/2018 2:12 PM
3	Critical to providing holistic care for an individual patent as well as a group of patients.	12/20/2017 5:27 PM
4	Healthcare is a complex, interdisciplinary endeavor	12/18/2017 5:51 PM
5	IPE promotes team based practice, thus working to improve quality of care and pt outcomes.	12/15/2017 7:20 AM

Interprofessional Education (IPE) Questionnaire - Survey Monkey

Q7 Please rank the barriers that you have encountered or foresee encountering with implementation of IPE at your institution (Please rank your top five barriers only with #1 being the biggest barrier).

Answered: 13 Skipped: 1



	1	2	3	4	5	6	7	8	9	10	11	12	TOT
Lack of common time available among disciplines participating in IPE	27.27% 3	27.27% 3	18.18% 2	18.18% 2	9.09% 1	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	
Lack of appropriate classroom or physical space	0.00% 0	0.00% 0	33.33% 1	33.33% 1	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	33.33% 1	
Lack of faculty interest in implementing IPE activities	0.00% 0	0.00% 0	0.00% 0	0.00% 0	33.33% 1	0.00% 0	0.00% 0	0.00% 0	0.00% 0	33.33% 1	33.33% 1	0.00% 0	
Competing priorities for faculty leading to lack of time to participate	40.00% 4	40.00% 4	0.00% 0	0.00% 0	10.00% 1	10.00% 1	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	
Lack of financial resources	18.18% 2	18.18% 2	27.27% 3	9.09% 1	27.27% 3	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	
Lack of human resources	40.00% 2	0.00% 0	0.00% 0	60.00% 3	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	

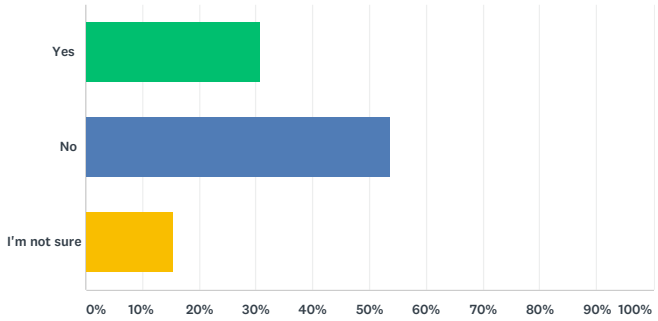
Interprofessional Education (IPE) Questionnaire - Survey Monkey

Sub-optimal communication between disciplines (use of different technologies)	0.00% 0	25.00% 1	25.00% 1	0.00% 0	0.00% 0	25.00% 1	25.00% 1	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0
Differences in operations of academic institutions or departments	0.00% 0	0.00% 0	16.67% 1	16.67% 1	50.00% 3	0.00% 0	0.00% 0	16.67% 1	0.00% 0	0.00% 0	0.00% 0	0.00% 0
Lack of appreciation of the roles of other professions within the team	0.00% 0	0.00% 0	0.00% 0	0.00% 0	33.33% 1	0.00% 0	0.00% 0	0.00% 0	33.33% 1	0.00% 0	33.33% 1	0.00% 0
Lack of reimbursement structures for interprofessional care	0.00% 0	25.00% 1	0.00% 0	25.00% 1	25.00% 1	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	25.00% 1
Lack of training in IPE and interprofessional collaboration	0.00% 0	16.67% 1	16.67% 1	16.67% 1	0.00% 0	16.67% 1	16.67% 1	16.67% 1	0.00% 0	0.00% 0	0.00% 0	0.00% 0
Lack of integrated IPE curriculum across disciplines	20.00% 2	10.00% 1	30.00% 3	10.00% 1	10.00% 1	0.00% 0	0.00% 0	0.00% 0	10.00% 1	10.00% 1	0.00% 0	0.00% 0

Interprofessional Education (IPE) Questionnaire - Survey Monkey

Q8 Does your institution currently allocate financial and/or human resources towards IPE?

Answered: 13 Skipped: 1



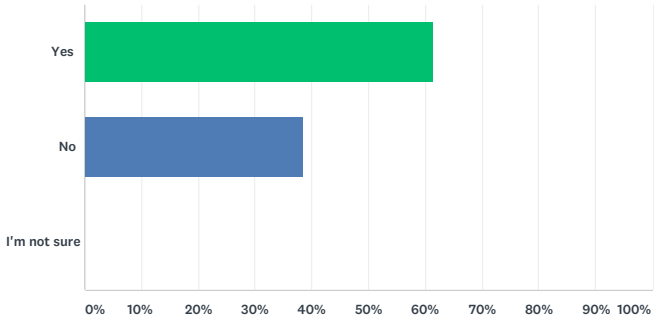
ANSWER CHOICES	RESPONSES	
Yes	30.77%	4
No	53.85%	7
I'm not sure	15.38%	2
TOTAL		13

#	IF YES, PLEASE DESCRIBE	DATE
1	~$250,000 per year	1/31/2018 4:44 PM
2	we have Health Systems Management degrees but not dedicated for an IPE or the funds to support it.	1/29/2018 9:12 AM
3	1. Financial resources for programmatic development (~$30k) 2. 0.75 FTE staff 3. Consulting 10% FTE 4. USG provides space for free to programs providing IPE experiences (i.e. the space to run the IPE event/experience is not charged)	1/2/2018 2:12 PM
4	There is no specific budget, but the institution does provide a small amount of occasional funding for specific activities.	12/22/2017 1:18 PM
5	Funds allocated to support the department of nursing and campus wide college of professional studies workshop. The department of nursing held the conference entitled: Let's Connect Colloquy! Held on Thursday, December 1, 2016. Jean Nagelkerk, PhD, FNP, FNAP Vice Provost for Health at Grand Valley State University, Allendale, MI was the workshop speaker-facilitator. Have a paid Department of Nursing (DON) membership in the Midwest Interprofessional Practice, Education and Research Center (MIPERC), headquartered 301 Michigan Street NE, Suite 400, Grand Rapids, MI 49503 An Assistant Professor in the DON faculty attended the Annual MIPERC conference in Grand Rapids, MI September 21-22nd, 2017.	12/20/2017 5:27 PM
6	IPE has been integrated into clinical education and fieldwork, which requires operational support (funds for copying, classroom materials, etc.) as well as faculty and staff resources from the state budget.	12/15/2017 7:20 AM

Interprofessional Education (IPE) Questionnaire - Survey Monkey

Q9 Is IPE required by your institution (or a program within your institution) for graduation?

Answered: 13 Skipped: 1



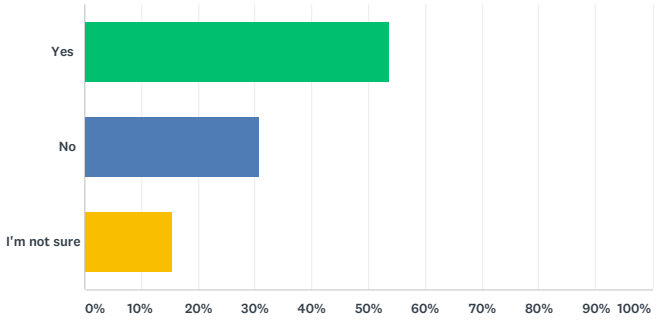
ANSWER CHOICES	RESPONSES	
Yes	61.54%	8
No	38.46%	5
I'm not sure	0.00%	0
TOTAL		13

#	PLEASE LIST SPECIFIC PROGRAMS AT YOUR UNIVERSITY THAT REQUIRE IPE FOR GRADUATION.	DATE
1	Required for pharmacy, medicine, nursing and PT at a minimum.	1/31/2018 4:44 PM
2	Pharmacy, and Physical therapy	1/17/2018 2:34 PM
3	There is no specific program, but emphasis is placed on the concepts. Interprofessional collaboration - communication is in the curriculum and faculty have made great strides in reinforcing the need for our students to engage in cooperative and collaborative educational relationships. A great deal of attention and emphasis is placed on assisting students to develop nursing care plans that incorporate interprofessional collaboration education in the plan of care as pertinent.	12/20/2017 5:27 PM
4	IPE is a requirement for our developing physician assistant program.	12/15/2017 12:15 PM
5	Some key clinical programs have required experiences within their curriculum; not participating would cause a student to be dismissed from/fail the program requirements. The programs include - speech language pathology, occupational therapy, and audiology. Other clinical programs have optional experiences that support IPE.	12/15/2017 7:20 AM
6	Master of Public Health, beginning Fall 2018.	12/8/2017 6:54 AM

Interprofessional Education (IPE) Questionnaire - Survey Monkey

Q10 Is your institution currently offering IPE experiences to students?

Answered: 13 Skipped: 1

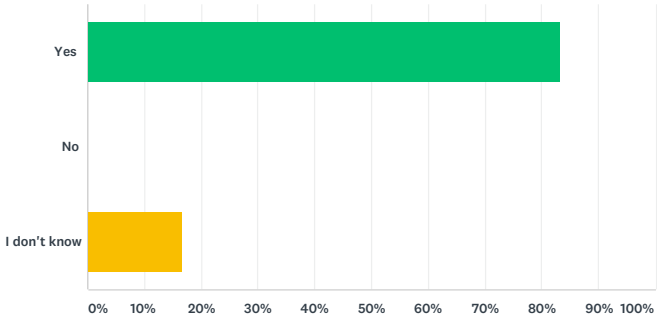


ANSWER CHOICES	RESPONSES	
Yes	53.85%	7
No	30.77%	4
I'm not sure	15.38%	2
TOTAL		13

Interprofessional Education (IPE) Questionnaire - Survey Monkey

Q11 Does your institution want to engage in IPE?

Answered: 6 Skipped: 8



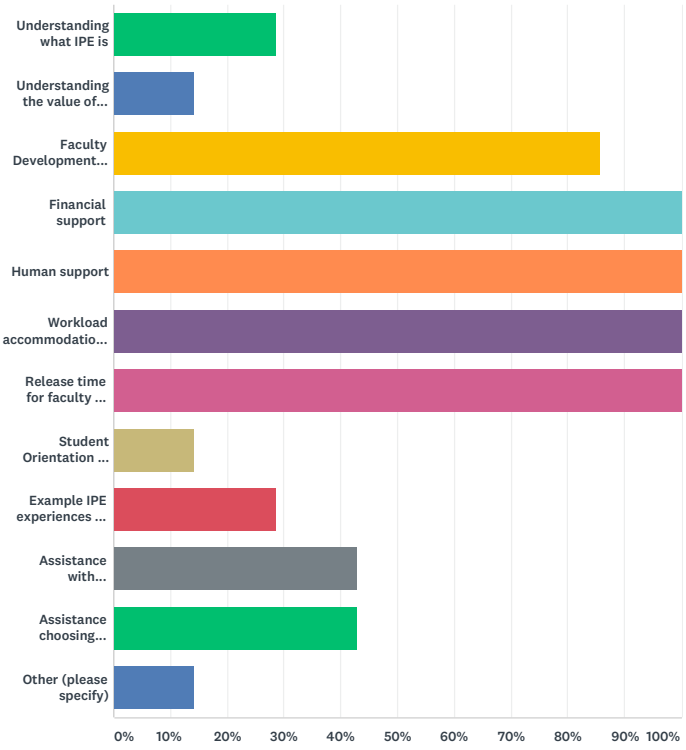
ANSWER CHOICES	RESPONSES	
Yes	83.33%	5
No	0.00%	0
I don't know	16.67%	1
TOTAL		6

#	COMMENTS	DATE
1	Right now we are undergoing Program Prioritization. This is helping us to focus efforts for the future so IPE is somewhat premature.	1/29/2018 9:13 AM
2	We are applying the concepts in education and clinical practice, but we do not have a fully designed specific IPE program. We are quite interested in establishing a formal IPE program for our students.	12/20/2017 5:30 PM
3	It will be a requirement for our physician assistant program. Our nursing department would like to offer IPE as part of their curriculum	12/15/2017 12:17 PM

Interprofessional Education (IPE) Questionnaire - Survey Monkey

Q12 What support or assistance would be useful in order to be able to engage in or improve IPE experiences at your institution?

Answered: 7 Skipped: 7



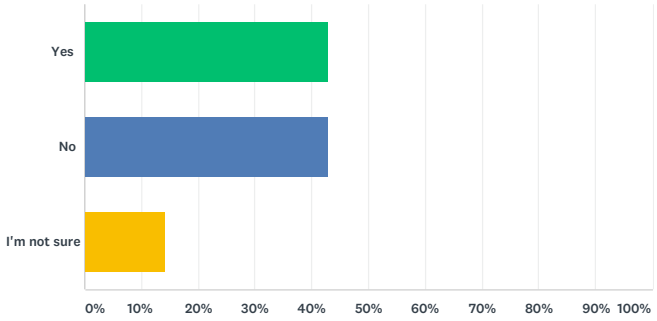
ANSWER CHOICES	RESPONSES	
Understanding what IPE is	28.57%	2
Understanding the value of IPE	14.29%	1
Faculty Development seminars surrounding IPE	85.71%	6
Financial support	100.00%	7
Human support	100.00%	7
Workload accommodations for faculty participating in development, implementation or sustainability of IPE experienes	100.00%	7
Release time for faculty to participate in development, implementation or sustainability of IPE experiences	100.00%	7
Student Orientation to IPE	14.29%	1
Example IPE experiences to model after	28.57%	2
Assistance with development of IPE experiences, courses, and/or curriculum	42.86%	3
Assistance choosing assessment instruments for IPE experiences	42.86%	3
Other (please specify)	14.29%	1
Total Respondents: 7		

#	OTHER (PLEASE SPECIFY)	DATE
1	1. Student incentives to participate in IPE 2. Common hour for IPE activities	1/2/2018 2:13 PM

Interprofessional Education (IPE) Questionnaire - Survey Monkey

Q13 Is your institution currently tracking exposure to IPE?

Answered: 7 Skipped: 7



ANSWER CHOICES	RESPONSES	
Yes	42.86%	3
No	42.86%	3
I'm not sure	14.29%	1
TOTAL		7

Interprofessional Education (IPE) Questionnaire - Survey Monkey

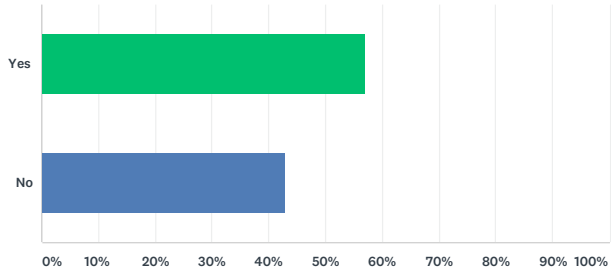
Q14 How is your institution tracking IPE exposure?

Answered: 3 Skipped: 11

#	RESPONSES	DATE
1	Survey	1/17/2018 2:41 PM
2	Through the Eastern Shore Collaborative for Interprofessional Education (ESCIPE)	12/22/2017 1:19 PM
3	Students are required to attend specific IPE activities during their time at UMES	12/18/2017 10:22 AM

Q15 Based on the IPE categories described above, are you able to approximate the number of hours in each category that the average student at your institution is engaged in by graduation?

Answered: 7 Skipped: 7

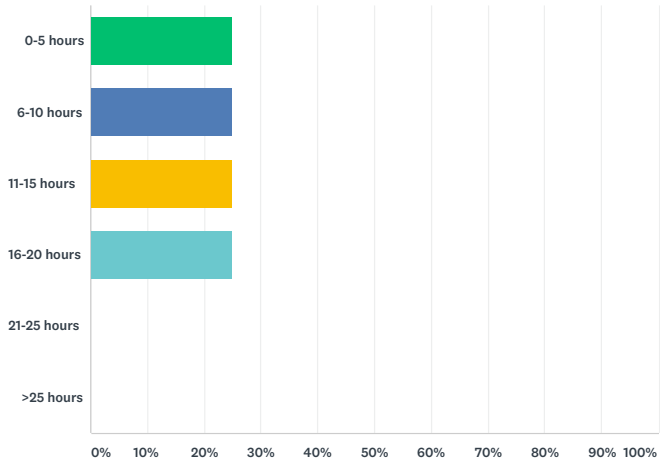


ANSWER CHOICES	RESPONSES	
Yes	57.14%	4
No	42.86%	3
TOTAL		7

Interprofessional Education (IPE) Questionnaire - Survey Monkey

Q16 For programs participating in IPE at your institution, please provide an approximate number of hours that the average student at your institution participates in "INTRODUCTORY/EXPOSURE" IPE activities.

Answered: 4 Skipped: 10



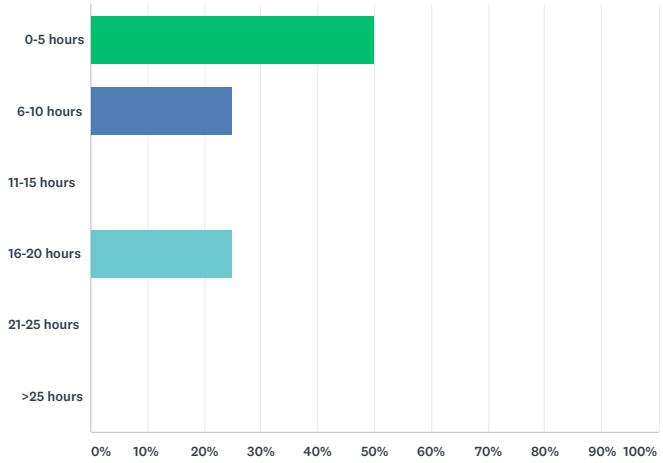
ANSWER CHOICES	RESPONSES	
0-5 hours	25.00%	1
6-10 hours	25.00%	1
11-15 hours	25.00%	1
16-20 hours	25.00%	1
21-25 hours	0.00%	0
>25 hours	0.00%	0
TOTAL		4

#	COMMENTS	DATE
1	This estimate is for healthcare majors only.	12/22/2017 1:21 PM

Interprofessional Education (IPE) Questionnaire - Survey Monkey

Q17 For programs participating in IPE at your institution, please provide an approximate number of hours that the average student at your institution participates in "IMMERSION/SIMULATION" IPE activities.

Answered: 4 Skipped: 10

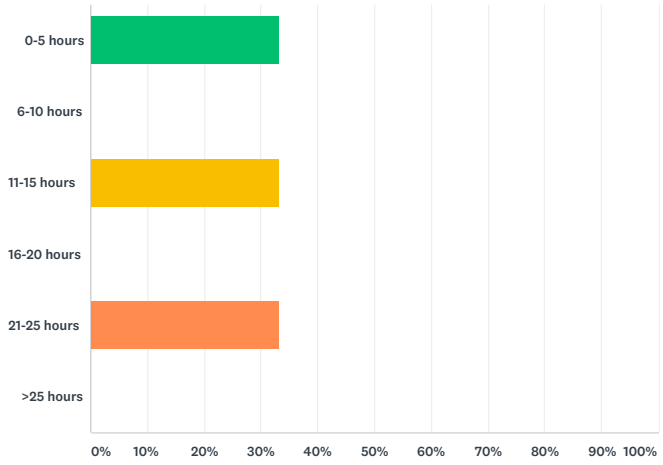


ANSWER CHOICES	RESPONSES	
0-5 hours	50.00%	2
6-10 hours	25.00%	1
11-15 hours	0.00%	0
16-20 hours	25.00%	1
21-25 hours	0.00%	0
>25 hours	0.00%	0
TOTAL		4

Interprofessional Education (IPE) Questionnaire - Survey Monkey

Q18 For programs participating in IPE at your institution, please provide an approximate number of hours that the average student at your institution participates in "EXPERIENTIAL/CLINICAL PRACTICE" IPE activities.

Answered: 3 Skipped: 11



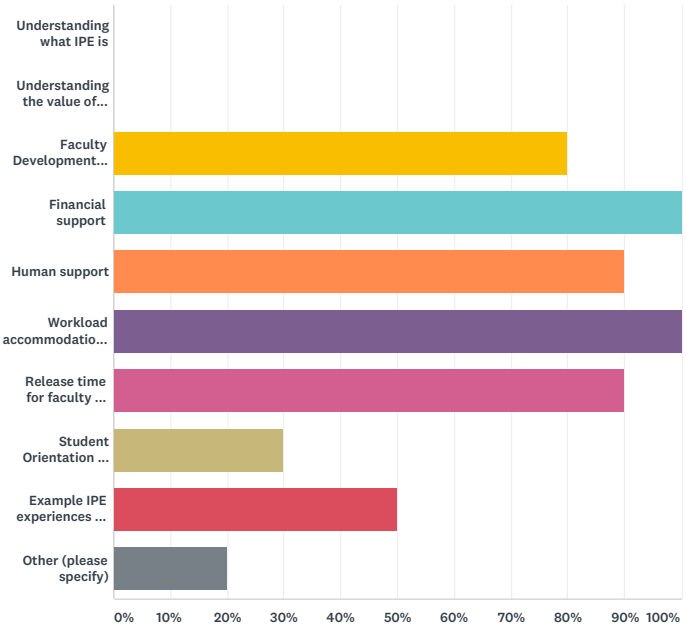
ANSWER CHOICES	RESPONSES	
0-5 hours	33.33%	1
6-10 hours	0.00%	0
11-15 hours	33.33%	1
16-20 hours	0.00%	0
21-25 hours	33.33%	1
>25 hours	0.00%	0
TOTAL		3

#	COMMENTS	DATE
1	This estimate is for healthcare majors only. This occurs within interdisciplinary rounds in the clinical setting.	12/22/2017 1:21 PM
2	IPE activities are provided during APPE rotations, however, tracking is not documented.	12/18/2017 10:38 AM

Interprofessional Education (IPE) Questionnaire - Survey Monkey

Q19 What support or assistance would be useful in order to be able to engage in or improve IPE experiences at your institution?

Answered: 10 Skipped: 4



ANSWER CHOICES	RESPONSES	
Understanding what IPE is	0.00%	0
Understanding the value of IPE	0.00%	0
Faculty Development seminars surrounding IPE	80.00%	8
Financial support	100.00%	10
Human support	90.00%	9
Workload accommodations for faculty participating in development, implementation or sustainability of IPE experienes	100.00%	10
Release time for faculty to participate in development, implementation or sustainability of IPE experiences	90.00%	9
Student Orientation to IPE	30.00%	3
Example IPE experiences to model after	50.00%	5
Other (please specify)	20.00%	2
Total Respondents: 10		

#	OTHER (PLEASE SPECIFY)	DATE
1	The first objective of the choices above would be to have faculty development seminars surrounding IPE. Secondly, workload accommodations for faculty participating in the development, implementation or sustainability of IPE experiences. Lastly, a designated professional to establish and implement the IPE program for sustainability.	12/20/2017 5:36 PM
2	Focused topics such as community health resiliency, emergency preparedness and response (which is a CMS Condition of participation), and population health.	12/18/2017 5:53 PM

APPENDIX I-B: BUDGET SUMMARIES FOR IPE ACTIVITIES GROUPED BY DOMAIN, AND DISCRETE BUDGETS FOR EACH IPE ACTIVITY

The resources needed to scale IPE activities are grouped by domain, not by university-specific projects. This approach affords decision-makers the flexibility to substitute activities, as might be necessary within each domain.

BUDGET SUMMARIES: IPE ACTIVITIES

EXPOSURE IPE ACTIVITIES: SUMMARY	
	TOTAL COST
Faculty Lead Salary/Benefits	$23,400
Faculty Coordinator Salary/Benefits	$46,800
Administrative/Coordinator Salary/Benefits	$54,015
Technology	$13,000
Conference Space	$26,000
Operating	$32,500
Annual Personnel and Operating Expenses	**$195,715**
One-time Program Set-up (Training/Development)	$39,000
One-time Start-up Expenses	**$39,000**

IMMERSION IPE ACTIVITIES: SUMMARY	
	TOTAL COST
Faculty Lead Salary/Benefits	$18,720
Faculty Coordinator Salary/Benefits	$88,920
Coordinator Salary/Benefits	$251,472
Administrative Salary/Benefits	$121,680
Technology	$39,000
Conference Space	$26,000
Operating	$225,758
Annual Personnel and Operating Expenses	**$771,550**
One-time Program Set-up (Training/Development)	$312,260
One-time Start-up Expenses	**$312,260**

COMPETENCE IPE ACTIVITIES: SUMMARY	
	TOTAL COST
Faculty Lead Salary/Benefits	$15,600
Faculty Coordinator Salary/Benefits	$234,000
Coordinator Salary/Benefits	$228,150
Administrative Salary/Benefits	$10,140
Technology	$32,500
Conference Space	$7,000
Operating	$37,000
Annual Personnel and Operating Expenses	**$564,390**
One-time Program Set-up (Training/Development)	$0
One-time Start-up Expenses	**$0**

BUGET SUMMARY: RESEARCH

Following is an estimated budget attached to the recommendation that USM identify IPE scholarship priorities and opportunities, and support inter-institutional research focused on those prorities

RESEARCH AND ASSESSMENT RESOURCE NEEDS			
IPE Research and Assessment	Cost	No. of Participating Universities	Total Cost
Faculty IPE Experts S&B	$7,800	15	$117,000
Administrative/Coordinator S&B	$1,170	13	$15,210
Graduate Research Assistants	$2,600	13	$33,800
Technology	$0	0	$0
Conference Space	$0	0	$0
Operating	$2,000	13	$26,000
Travel	$2,000	13	$26,000
Annual Personnel and Operating Expenses			**$218,010**
One-time Program Set-up (Training/Development)			**$0**
One-time Start-up Expenses			**$0**

DISCRETE BUDGETS FOR EACH IPE ACTIVITY WITHIN THE EXPOSURE, IMMERSION, AND COMPETENCE DOMAINS

IPE Exposure: Interprofessional Scope-of-Practice Seminar									
	Cost	No. of Participating Universities	Total Cost		Salary	FTE	Salary	Fringe	Salary/Fringe
Faculty Lead Salary & Benefits	$7,800	1	$7,800	Lead curriculum development & organization	$120,000	0.05	$6,000	$1,800	$7,800
Faculty Coordinator S&B	$3,120	12	$37,440	Faculty site coordinator & assist with curriculum development	$120,000	0.02	$2,400	$720	$3,120
Administrative Coordinator S&B	$3,000	13	$39,000	On-site coordinator	$46,500	0.05	$2,325	$690	$3,015
Technology	$0	13	$0						
Conference Space	$1,000	13	$13,000						
Operating	$1,000	13	$13,000						
Annual Personnel and Operating Expenses			**$110,240**						
One-Time Program Set-up (Training/Development)	$ 1,000	13	$13,000						
Maryland Research and Education Network*	$0	13	$0						
One-time Start-up Expenses			**$13,000**						

Assumes availability of MREN video/audio conferencing capabilities at each institution.
Assumes once per semester.

IPE Exposure: Foundations of Interprofessional Education and Practice									
	Cost	No. of Participating Universities	Total Cost		Salary	FTE	Salary	Fringe	Salary/Fringe
Faculty Lead Salary & Benefits	$7,800	1	$7,800		$120,000	0.05	$6,000	$1,800	$7,800
Faculty Coordinator S&B	$0	12	$0		$120,000	0.00	$0	$0	$0
Administrative Coordinator S&B	$1,155	13	$15,015	On-site coordinator	$46,500	0.01	$465	$690	$1,155
Technology	$0	13	$0						
Conference Space	$1,000	13	$13,000						
Operating	$1,000	13	$13,000						
Annual Personnel and Operating Expenses			**$48,815**						
One-Time Program Set-up (Training/ Development)	$1,000	13	$13,000						
One-time Start-up Expenses			**$13,000**						

Assumes once per semester.

IPE Exposure: Gates NEXUS					Salary	FTE	Salary	Fringe	Salary/Fringe
	Cost	No. of Participating Universities	Total Cost						
Faculty Lead Salary & Benefits	$7,800	1	$7,800		$120,000	0.05	$6,000	$1,800	$7,800
Faculty Coordinator S&B	$3,120	3	$9,360		$120,000	0.02	$2,400	$720	$3,120
Administrative Coordinator S&B	$0	13	$0		$46,500	0.00	$0	$0	$0
Technology	$1,000	13	$13,000						
Conference Space	$0	13	$0						
Operating	$500	13	$6,500						
Annual Personnel and Operating Expenses			**$36,660**						
One-Time Program Set-up (Training/Development)	$1,000	13	$13,000						
One-time Start-up Expenses			**$13,000**						

Dissemination activity

IPE Immersion: Friday Night at the ER					Salary	FTE	Salary	Fringe	Salary/Fringe
	Cost	No. of Participating Universities	Total Cost						
Faculty Lead Salary & Benefits	$4,680	1	$4,680		$120,000	0.03	$3,600	$1,080	$4,680
Faculty Coordinator S&B	$3,120	3	$9,360	Site facilitator	$120,000	0.02	$2,400	$720	$3,120
Coordinator S&B	$1,209	13	$15,717		$46,500	0.02	$930	$279	$1,209
Administrative S&B	$0	13	$0		$30,000	0.00	$0	$0	$0
Technology	$1,000	13	$13,000						
Conference Space	$500	13	$6,500						
Operating	$500	13	$6,500						
Annual Personnel and Operating Expenses			**$55,757**						
One-Time Program Set-up (Training/ Development)	$1,000	13	$13,000						
One-time Start-up Expenses			**$13,000**						

Assumes once per semester.

IPE Immersion: GAIT									
	Cost	No. of Participating Universities	Total Cost		Salary	FTE	Salary	Fringe	Salary/Fringe
Faculty Lead Salary & Benefits	$1,560	1	$1,560		$120,000	0.01	$1,200	$360	$1,560
Faculty Coordinator S&B	$0	3	$0		$120,000	0.0	$0	$0	$0
Coordinator S&B	$18,135	13	$235,755		$46,500	0.3	$13,950	$4,185	$18,135
Administrative S&B	$7,800	13	$101,400		$30,000	0.2	$6,000	$1,800	$7,800
Technology	$0	13	$0						
Conference Space	$0	13	$0						
Operating	$15,966	13	$207,558	Includes travel and general					
Annual Personnel and Operating Expenses			**$546,273**						
One-Time Program Set-up (Training/Development)	$1,000	13	$13,000						
One-time Start-up Expenses			**$13,000**						

Combined UMB & UMES scaled to all institutions.
Assumes 10 times per academic year.

IPE Immersion: POD Drill									
	Cost	No. of Participating Universities	Total Cost		Salary	FTE	Salary	Fringe	Salary/Fringe
Faculty Lead Salary & Benefits	$3,120	1	$3,120		$120,000	0.02	$2,400	$720	$3,120
Faculty Coordinator S&B	$1,560	12	$18,720		$120,000	0.01	$1,200	$360	$1,560
Coordinator S&B	$0	13	$0		$46,500	0.0	$0	$0	$0
Administrative S&B	$390	13	$5,070		$30,000	0.01	$300	$90	$390
Technology	$0	13	$0						
Conference Space	$500	13	$6,500						
Operating	$300	13	$3,900						
Annual Personnel and Operating Expenses			**$37,310**						
One-Time Program Set-up (Training/Development)	$20,020	13	$260,260	Includes initial operating costs	$120,000	0.12	$14,400	$4,320	$18,720
One-time Start-up Expenses			**$260,260**						

Assumes once per academic year.

IPE Immersion: Interprofessional Approach to the Critically Ill Patient

	Cost	No. of Participating Universities	Total Cost		Salary	FTE	Salary	Fringe	Salary/Fringe
Faculty Lead Salary & Benefits	$3,120	3	$9,360		$120,000	0.02	$2,400	$720	$3,120
Faculty Coordinator S&B	$3,120	13	$40,560		$120,000	0.02	$2,400	$720	$3,120
Coordinator S&B	$0	13	$0		$46,500	0.00	$0	$0	$0
Administrative S&B	$780	13	$10,140		$30,000	0.02	$600	$180	$780
Technology	$1,000	13	$13,000						
Conference Space	$500	13	$6,500						
Operating	$300	13	$3,900						
Annual Personnel and Operating Expenses			**$83,460**						
One-Time Program Set-up (Training/Development)	$1,000	13	$13,000						
One-time Start-up Expenses			**$13,000**						

Case course
Assumes availability of the MREN video/audio conferencing capabilities at each institution.

IPE Immersion: Poverty Simulation

	Cost	No. of Participating Universities	Total Cost		Salary	FTE	Salary	Fringe	Salary/Fringe
Faculty Lead Salary & Benefits	$0		$0		$120,000	0.00	$0	$0	$0
Faculty Coordinator S&B	$1,560	13	$20,280		$120,000	0.01	$1,200	$360	$1,560
Coordinator S&B	$0	13	$0		$46,500	0.00	$0	$0	$0
Administrative S&B	$390	13	$5,070		$30,000	0.01	$300	$90	$390
Technology	$1,000	13	$13,000						
Conference Space	$500	13	$6,500						
Operating	$300	13	$3,900						
Annual Personnel and Operating Expenses			**$48,750**						
One-Time Program Set-up (Training/Development)	$1,000	13	$13,000						
One-time Start-up Expenses			**$13,000**						

Assumes once per semester.

IPE Competence: ESCIPE									
	Cost	No. of Participating Universities	Total Cost		Salary	FTE	Salary	Fringe	Salary/Fringe
Faculty Lead Salary & Benefits	$0		$0		$120,000	0.00	$0	$0	$0
Faculty Coordinator S&B	$1,560	13	$20,280		$120,000	0.01	$1,200	$360	$1,560
Coordinator S&B	$0	13	$0		$46,500	0.00	$0	$0	$0
Administrative S&B	$390	13	$5,070		$30,000	0.01	$300	$90	$390
Technology	$1,000	13	$13,000						
Conference Space	$500	13	$6,500						
Operating	$300	13	$3,900						
Annual Personnel and Operating Expenses			**$48,750**						
One-Time Program Set-up (Training/Development)	$1,000	13	$13,000						
One-time Start-up Expenses			**$0**						

Assumes once per semester.

IPE Competence: Off-site Clinical Rotations (e.g., Paul's Place & Montgomery County Clinics)									
	Cost	No. of Participating Universities	Total Cost		Salary	FTE	Salary	Fringe	Salary/Fringe
Faculty Lead Salary & Benefits	$0		$0		$120,000	0.00	$0	$0	$0
Faculty Coordinator S&B	$0		$0		$120,000	0.00	$0	$0	$0
Coordinator S&B	$17,550	13	$228,150	Clinical coordination	$90,000	0.15	$13,500	$4,050	$17,550
Administrative S&B	$390	13	$5,070		$30,000	0.01	$300	$90	$390
Technology	$0		$0						
Conference Space	$0		$0						
Operating	$1,000	13	$13,000						
Annual Personnel and Operating Expenses			**$246,220**						
One-Time Program Set-up (Training/Development)	$0		$0						
One-time Start-up Expenses			**$0**						

Assumes 4-hour weekly sessions, with 1-hour education.
Assumes clinical rotation occurs at all institutions.
Each institution will need to identify clinical outreach site.
Budgeted per one off-site clinical rotation.

IPE Research and Assessment									
	Cost	**No. of Participating Universities**	**Total Cost**		**Salary**	**FTE**	**Salary**	**Fringe**	**Salary/Fringe**
Faculty IPE Experts S&B	$7,800	15	$117,000		$120,000	0.05	$6,000	$1,800	$7,800
Administrative/Coordinator S&B	$1,170	13	$15,210		$30,000	0.03	$900	$270	$1,170
Graduate Research Assistants	$2,600	13	$33,800		$40,000	0.05	$2,000	$600	$2,600
Technology	$0		$0						
Conference Space	$0		$0						
Operating	$2,000	13	$26,000						
Travel	$2,000	13	$26,000						
Annual Personnel and Operating Expenses			**$218,010**						
One-Time Program Set-up (Training/Development)	$0		$0						
One-time Start-up Expenses			**$0**						

To engage study/evaluation and learning objectives for IPE activities.