

**Faculty Perspectives about Facilitators and
Barriers to Interprofessional Education of Students**

BY

EVE R. COLSON
MD, Yale University School of Medicine, 1989

THESIS

Submitted as partial fulfillment of the requirements
for the degree of Master of Health Profession Education
in the Graduate College of the
University of Illinois at Chicago, 2014

Chicago, Illinois

Defense Committee:

Ilene B. Harris, Chair and Advisor
Carol Kamin
Janet Hafler, Yale School of Medicine

ACKNOWLEDGEMENTS

I would like to thank Ilene Harris, PhD and Carol Kamin, MS, EdD, from the University of Illinois, Chicago School of Medicine and Janet Hafler, EdD, from Yale School of Medicine, for their guidance with this thesis project. In addition, I very much appreciate the critical input of John Encandela, PhD from Yale School of Medicine and the technical assistance from Tracy Yale, MS.

I would also like to thank my husband Jeff and my children Rebekah, Joseph and Sarah for their steadfast support.

The research presented here is part of a larger project done in collaboration with colleagues in Medicine and Nursing at the University of Pennsylvania Perelman School of Medicine and my colleagues Paula Schaeffer, MS, Yale School of Medicine and Mary Warner, MMSc, PA-C, Boston University School of Medicine.

This project would not have been possible without the support of the Josiah Macy Jr. Foundation and the Northeast Group on Educational Affairs (NEGEA).

ERC

TABLE OF CONTENTS

<u>CHAPTER</u>	<u>PAGE</u>
I. INTRODUCTION	1
II. METHODS	8
A. Sample	8
B. Data Collection and Analysis.....	8
C. Results	9
III. PREDISPOSING FACTORS	13
A. Culture	13
1. Hierarchy/power	13
2. Working relationships	14
3. Professional roles and identity	15
4. Professional isolation.....	17
5. Change	18
6. Interprofessional work and patient care.....	19
7. Perception of teams	20
IV. ENABLING FACTORS.....	22
A. Forces.....	22
1. Outside recommendations/mandates	22
2. Local champions.....	23
3. Resources	24
B. Curriculum.....	25
1. Logistics	25
2. Faculty development.....	26
3. Establishment of joint goals	27
V. REINFORCING FACTORS	28
A. Interprofessional experiences	28
1. Job satisfaction.....	28
2. Personal experiences	28

3.	Career.....	29
VI.	DISCUSSION	31
VII.	REFERENCES	34

LIST OF TABLES

<u>TABLE</u>	<u>PAGE</u>
I. Themes and Subthemes within the Kern Framework	11

SUMMARY

In this paper, I introduce the importance of interprofessional education and the need to establish effective interprofessional curricula at institutions educating healthcare professional students. This is followed by the evidence that while national and international organizations recommend interprofessional education, change at the local level can be difficult. For this reason, using Kern's framework for curriculum development (1), we undertook a needs assessment to understand better our own local context as a preliminary step for curriculum design and implementation. Using qualitative methods, we identified predisposing, enabling and reinforcing factors important to recognize and to address in order to achieve our goal of institutionalizing an effective interprofessional curriculum. In the discussion, I suggest that these factors might most effectively be addressed using a framework for change, such as the eight steps proposed by Kotter. (2)

I. INTRODUCTION

In the century since the Flexner report, the healthcare system in the United States has become increasingly complex, and the patients who receive care within that system have increasingly complex illnesses. (3,4) By necessity, patients with complex illnesses are seen by many healthcare providers because no single healthcare provider can address their multiple needs. (5,6,7,8) A patient with severe diabetes, for example, might be followed by an interprofessional team consisting of a nephrologist for dialysis, a rehabilitation specialist for difficulty with ambulation, an advanced practice nurse for primary care and an ophthalmologist for complicated eye problems.

The weight of the research indicates improved patient care when these various healthcare providers work well together. (9,10) In a review of the history of the effect of interprofessional collaboration, Baldwin points to work dating back to the 1970s showing that teamwork, as exemplified by effective interprofessional communication and collaboration, leads to improved care. (11) For example, Rubenstein and colleagues reported on a randomized trial examining the outcomes of patients assigned to a geriatric evaluation unit. The unit was characterized by coordinated and collaborative care from physicians, nurses, social workers and rehabilitation specialists. A year after hospitalization, patients who were in the geriatric unit had a significantly lower mortality rate, were less likely to have required nursing home care and were less likely to be readmitted to the hospital than patients who received standard care. (12)

Among more recent examples, Curry and colleagues have identified modifiable characteristics of various hospitals that improve outcomes for patients presenting with acute myocardial infarctions. These characteristics included monthly meetings of all healthcare providers to examine their data and to make plans for improvements. They also found decreased mortality among patients treated in hospitals having both a physician and nurse champion for care of these patients, a marker of successful interprofessional collaboration. High performing hospitals consistently integrated and empowered all healthcare professionals, leveling the traditional hierarchical culture in hospitals.

In addition, a Cochrane review of several studies, Reeves and colleagues found that interprofessional education had a positive impact on team collaboration and reduction in clinical errors. (10). Brock and colleagues studied an interprofessional team-training curriculum and found that students learned important elements of effective communication and the value of a well functioning team in the care of patients. As George Thibault summarized in a recent article in *Academic Medicine*, we are now at the stage where we know that “well-designed and rigorous IPE experiences that allow learners from two or more professions to learn ‘about and from each other’ can better prepare health professionals for collaborative practice”. (5)

Despite establishment of a compelling link between excellent collaboration among healthcare providers and interprofessional education, healthcare provider education usually does not include robust and meaningful interprofessional curricula to foster the development of interprofessional collaboration and communication skills. (3) For the most part, healthcare students are taught in their own professional schools in silos, with little meaningful interaction with students from other healthcare professions. (3) Although

students are expected to work in teams and should be skilled in interprofessional collaboration and communication, they are not prepared to do so upon graduation. (3,4) *Thus there is a gap between education (what we teach) and practice (what healthcare providers are expected to do) that can lead to poor quality of care and affect patient safety.*

For these reasons, national and international organizations have made recommendations that interprofessional education be an essential part of the curricula for all healthcare provider students. (5,6,7,8,15,16) For example, the Commission on Education of Health Professionals for the 21st Century, which included 20 leaders in healthcare and health professional education from around the world, recently published a report stating that instructional reform should “promote interprofessional and transprofessional education that breaks down professional silos while enhancing collaborative and non-hierarchical relationships in effective teams”. (15) Accreditation bodies have made interprofessional education a mandatory part of the curriculum. (17) Beyond the general recommendation to include IPE in curricula, some organizations have made specific recommendations for teaching IPE. Such activities would include longitudinal relationships with a variety of healthcare students that are directly related to patient care, in contrast to didactic sessions in the classroom. (6) Several organizations, from multiple health care disciplines, have joined forces to formulate specific core competencies that have been identified as important goals of curricula for all healthcare professional students. These competencies include: demonstration of values and ethics for interprofessional practice, demonstrating effective individual and team functioning in interprofessional roles and responsibilities, and interprofessional communication. (6)

Despite the recommendations for universal IPE, institutions have struggled with implementation. (11) In a review of the history of IPE, Baldwin points out that interprofessional collaboration is not a new concept. International efforts to provide community-based healthcare have included healthcare professions from many fields and specific examples of collaboration date back to the early 1900s. During World War 2, teams of healthcare providers joined together to provide care for soldiers in the field. (11)

Baldwin outlines barriers to the implementation of IPE that include what he calls barriers of “disciplinary territoriality and systems inertia”. He goes on to say: “As with the mythical Sisyphus, each forward push seems to end with a return to the point of origin, with little tangible evidence of impact or permanence”. (11) In reviewing the available literature and from his own extensive experience, Baldwin identified 10 key barriers to interprofessional education: 1) lack of meaningful experiences in the curricula; 2) lack of role models; 3) traditional, linear education models; 4) turf issues; 5) accreditation requirements; 6) power dynamics; 7) resistance from program administration; 8) scheduling logistics; 9) expenses and 10) resistance to curricular change. (11)

Authors of other studies have confirmed similar barriers. Researchers in Canada conducted a grounded theory study, relying on key informants from different healthcare professions, to assess beliefs that might affect implementation of IPE and collaborative practice. They found that culture, logistics and external support were among the key factors. Researchers in the United Kingdom reported that participants agreed that IPE had potential for improving teamwork among healthcare professionals and might break down traditional cultural “tribalism” found in the healthcare setting. However, there were conflicting views about early exposure of healthcare professional students to each other

because of concerns about professional identity formation. The participants also agreed that, to be successful, IPE should occur as part of a meaningful experience in the clinical setting, not in single or even multiple didactic sessions in the classroom. (19) Thus, IPE has been viewed as important for producing healthcare providers who can collaborate and communicate effectively, thereby ensuring high quality and safe care for their patients; yet few centers have designed and implemented successful, institutionalized curricula.

Difficulty with translating national recommendations into changes at the local level is not new. Beyond healthcare, industries have struggled to bring about changes at the local level in large part because challenges faced may vary depending on the local context. Rogers writes about common challenges faced when trying to diffuse innovations. He argues that there are four elements present in every innovation program. The first element is the innovation itself, which in this case is the educating healthcare professional students together in a meaningful way. The innovation has to be communicated through certain channels, over a period of time and within a social system. (20) The process of getting schools to adopt IPE requires communication about the innovation through the appropriate channels, which need to be identified, time for the communication to take place and consideration of the social and cultural context. Although helpful, it is not necessarily enough to have mandates from national and international agencies, such as the Institute of Medicine or the World Health Organization.

For these reasons, it is important to evaluate the responsiveness to innovation at the local level in order to be successful in implementation of a new idea such as IPE. Kern et al present a conceptual framework for designing and implementing curricula that includes understanding the context in which the curriculum will take place. According to Kern,

curriculum developers must first identify the problem. (1) With regard to IPE, the problem, as stated above, is that *the gap between education (what we teach) and practice (what healthcare providers are expected to do) can lead to poor quality of care and affect patient safety.*

Consistent with Kern's framework, curriculum developers should conduct a needs assessment by examining what is currently done and comparing this with the ideal. In the case of IPE, education occurs in silos, but should ideally occur, in interprofessional groups, when appropriate, so that students learn about and from each other, in preparation for their joint care of patients. As part of the needs assessment, curriculum designers must examine the many factors in any complex system that could aggravate or alleviate the problem at hand. The key to designing and implementing a successful curriculum would include understanding "predisposing factors", "enabling factors" and "reinforcing factors".

(1). Predisposing factors refer to the knowledge, attitudes and beliefs that healthcare providers have about IPE and how those are affected by the social context in which healthcare is practiced. For example, for IPE and practice, curriculum designers should learn what key stakeholders know and think about IPE that might make it easier or more difficult to implement a successful curriculum. (1) Enabling factors refer to environmental factors or individual skills that affect curriculum development. For IPE, institutional support and individual leadership skills of key stakeholders could be important. Reinforcing factors refer to ways in which behaviors might be reinforced or hindered through, for example, remuneration or promotion. (1)

Given the complexities of behavior change and the evidence that designing and implementing successful curricula in IPE has been challenging, the purpose of this study

was to identify academic, interprofessional faculty perspectives about IPE in anticipation of the design and implementation of an interprofessional curriculum for healthcare professional students at Yale University.

II. METHODS

We chose qualitative research methods because we sought to identify the range of perspectives about IPE at our institution, since we were unsure about what perspectives existed at our institution. In addition, rather than testing a hypothesis, we hoped to generate ideas about the phenomenon of IPE. (21,22)

A. Sample

We recruited participants from the Yale University Schools of Medicine and of Nursing and from the Physician Associate Program. Sampling was purposive. We invited faculty who had been or were currently involved in teaching students and had some type of administrative role in education. All faculty members who were first approached via an email introduction from a researcher, agreed to participate. The interviews were audio recorded and transcribed by an independent transcription service. A research associate skilled in qualitative methods reviewed all transcripts for accuracy.

B. Data Collection and Analysis

A single researcher associate, not known to the subjects, with a background in qualitative research and experience with in-depth interviewing, conducted face-to-face, semi-structured interviews lasting up to approximately 45 minutes. An interview guide was created; data collection and analysis was done simultaneously and in an iterative fashion, so that based on the results of the initial analysis we made changes in the interview questions. The interview began with an icebreaker question asking participants to describe their current role in education and their clinical work, where applicable. As a way to help participants think about IPE, we then asked about experiences the participant had as a

teacher and/or learner in an interprofessional setting. Finally, we asked participants to describe what they saw as barriers and facilitators to designing and implementing IPE at their schools.

Each transcript was reviewed line-by-line by at least two researchers. Initial open coding was done, with each transcript, to identify themes. In subsequent interviews, the interview guide was adapted, to explore findings formulated from analysis of previous transcripts. As more themes were identified and recurrent themes were identified, a formal set of themes was developed. Using the constant comparative method of analysis (21,22) associated with grounded theory, all transcripts were then re-reviewed with the set of themes that had been developed. Two of the researchers reviewed all transcripts, and several other researchers from the School of Nursing, the School of Medicine and the Physician Associate Program were enlisted to read several of the transcripts to discuss the themes. Consensus was reached for any disagreements in coding. All data were entered into AtlasTi for organizational purposes. Data collection ended when theoretical saturation was reached, meaning that no new themes were identified. (21)

This research was given exempt status by the University of Illinois, Chicago and Yale University research review boards.

C. Results

Eighteen (18) faculty members were interviewed. Of those, eight held faculty appointments at the School of Medicine, six at the School of Nursing and four in the Physician Associate Program. Ten (10) of the 18 participants (56%) were female and 12 (67%) were over the age of 50. Participants held a variety of administrative positions,

including deans and associate deans, as well as program directors. Their clinical specialties varied and included surgery, psychiatry, internal medicine and pediatrics.

There were four main themes identified in analysis of the data. These overarching themes were *culture, forces, curriculum and experiences*. There were a number of key subthemes that were included in these main themes. The table lists the themes and subthemes. We used the conceptual framework formulated by Kern for organizing each theme and subtheme as predisposing factors (e.g., beliefs about IPE that could help or hinder design and implementation), enabling factors (e.g., environmental factors or individual skills that could help or hinder curriculum design and implementation) or reinforcing factors (e.g., behaviors that could help or hinder design and implementation) within the table below.

TABLE 1**Themes and Subthemes Within the Kern Framework**

	Theme	Subtheme	Help	Hinder
Predisposing Factors	Culture	Hierarchy	Equal value	Unequal value
		Working Relationships	Respectful	Disrespectful
			Good communication	Poor communication
			Good collaboration	Poor collaboration
			Trust	Distrust
		Professional identity formation	Team-related identity	Profession-related identity
		Professional isolation	Supporting taking down silos	Supporting siloed system
			Supporting shared “turf”	Supporting “turf wars”
		Change	Open to change	Resisting change
			Learning from history	Keeping the status quo
			Supporting flexible gender roles	Keeping inflexible gender roles
		IPE work and patient care	Leading to better care	Doubting better care
		Belief in a need for teams	Supporting importance of teamwork	Doubting importance of teamwork
Enabling factors	Forces	Outside recommendations and mandates	Following recommendations	Dismissing recommendations
		Local champions	Promoting efforts	Against efforts
		Resources	Promoting IPE	Hampering IPE
	Curriculum	Logistics	Addressing them	Stopped by them
		Faculty development	Recognizing as a key to success	Stopped by difficulty
		Establishing joint goals	Agreeing there are joint goals	Believing there are no important joint goals
Reinforcing factors	Interprofessional experiences	Job satisfaction	Improving satisfaction	Causing dissatisfaction
		Personal Experiences	Inspired by good experiences	Dissuaded by bad experiences
		Career	Advancing through IPE work	Not advancing through IPE work

Next, we report these themes and subthemes with specific examples drawn directly from the transcripts. Some quotes have been edited for ease of reading, but without altering their meaning.

III. PREDISPOSING FACTORS

A. Culture

1. Hierarchy/Power

There were many quotes throughout the transcripts that referred to the culture of the healthcare system. Participants referred to the power structure that pervades the system, with many participants specifically using the word “hierarchy”. Physicians were often referred to as the “captain” or head of the hierarchy. Most participants viewed the hierarchy as a hindrance to interprofessional work and many spoke of the need for an equal balance of power in the work place. Some described positive experiences they had in situations that were less hierarchical. Many alluded to the difficulties faced when trying to change the power dynamic.

As an example, one Physician Associate said:

“I think what was also interesting is once again, the physician, whether medicine or surgeon was the team leader and sort of ultimately decided on which one of things were actually going to be implemented and sometimes I kind of wondered like-I know you need a leader on every -for every patient. Otherwise, it would be like a little cliché, too many, you know, chefs in the kitchen type of thing. So it’s important to have one. But I sometimes wondered why sometimes they their choice trumped by someone else who had more expertise in that area. I thought that was kind of interesting, especially when it was something like pharmacy. They’re like no, I don’t want that medicine. Well, just because you don’t like it, doesn’t mean it’s not necessary for this patient. So instead of saying something like tell me-tell me why that medicine would be better for this patient versus-

they just sort of would say no and the pharmacist would be quiet. They wouldn't say, well, let's talk about it some more. I mean it's sort of like a-the final word without a discussion....." (P11)

Echoing these ideas, a physician said:

"The idea is to build a team and to create a culture of everybody acting as a team and that's probably very easy to develop for most of the team except for the physician and so the issue is will the physician consider themselves part of the team or the captain of the team and, uh, I suspect that it will take a long time if ever to change the culture where the physician does not feel like a captain of the team". (P16)

Specifically addressing the hierarchy issue, a physician said:

"So you can't keep teaching and pretend that everybody's equal when then they get into the hospital and they're not equal. So we've decided that the time is right because all this interprofessional teaching is going on, somebody better damn well recognize the hierarchy." (P4)

2. Working relationships

In the context of interprofessional work, most participants discussed their views about what makes for good and bad working relationships. Words such as communication, collaboration, respect and trust were identified in many of the transcripts.

One nurse, frustrated with the behavior of some physicians in working relationships with nurses, and the perpetuation of this problem, said:

"The problem with it is that those people who are involved as the TAs, the senior physicians, were brought up in an era that has a whole different set of ideas about women

and about nurses and about healthcare and I know some of those guys and I talk to them and they say things like well, [nurses name], I'm so proud that when I was with my medical students, "my" medical students this week, I told them you better listen to the nurses because they'll make your life really difficult if you don't and I wanted to wring his neck. Come on. But for the medical school to do that and not realize the consequences of putting those attitudes out there in the first year of medical school is just really sad. So it's not surprising that when medical students get to their fourth year, they're poisoned and so to have to change their heads around to work with them as equals in teaching is really, really hard. (P3)

Commenting on the increasing need for effective collaboration, one physician said:

"I think we're again, we're going to be working more closely than ever in the future with nurse practitioners, getting more and more into primary care. Physicians specializing more and more. So now we need to really understand how to talk to each other and how to respect each other and how to pick up the phone and not look like this one's up and this one's down or whatever." (P6).

3. Professional roles and identity

Many participants discussed roles and professional identity. Some participants believed it is important that students form their own professional identity before working with students from other healthcare professions. Others believed that early exposure to working with other health professionals was important and protected health professionals from later erosion of working relationships.

Advocating for early exposure to other health professionals and for better understanding of roles and responsibilities, one nurse said:

"I am not threatening you in any way, shape, or form. I don't want to do what you do. I like being able to do patient education. I like being able to do counseling. Those are the things I want to do. I don't want to do a revolving door with patients coming in and out. I don't know why you do, but that's your issue. You know what I mean? But I like what I do. I like my practice. I don't want to do what you do. Get the fear out of it. I'm not trying to take over what you do. I'm just trying to do what I do and since we both have to work together, shouldn't we be starting during their very first days at Yale School of Medicine, saying welcome to Yale School of Medicine." (P9).

A physician discussed the issues of autonomy and independence versus working together as a team. Training together could be perceived as threatening autonomy, independence and development and maintenance of a unique professional identity.

"And then there is a long history of, you could say, political differences among the professions, who each have an understandable wish to both protect and to clarify their unique identity. So, to some extent, the more you want to demonstrate how different you are, to be clear that you should have autonomy, that you're your own profession, that you set your own standards, it means that when you bring different professions together, to train together, can threaten to some extent, the autonomy or independence of the various professions and so that is sometimes a risk." (P16)

Another physician remarked about her work in IPE and her experience, specifically, with addressing role identity.

"But I think that it has uncovered pieces of people's role identity that they, at some points, would have rather not uncovered. So there certainly have been some, you know, sessions that have been a little heated that we've run. But, part of the grant is for us to get these things out on the table about different roles and professions as opposed to just, you know, pretending that we're all the same and everything's fine. So we, with our program, we try to push the envelope with interprofessional attitudes working together. You know, perceptions of how we see other professions. So it's been interesting." (P18)

4. Professional isolation

Most participants discussed our current system of siloed education. In addition, professional isolation was felt to be influenced by perceptions of turf and, for some, a need to protect professional turf.

Commenting about the effect of educating in silos, one nurse said:

"We educate in silos and we expect them to magically work in teams and what has it proven? It's proven what? Our safety is abysmal." (P9)

A physician commented about the need to have students educated together:

"We have such a siloed approach to education in this school which I think is probably mirrored by others, but to me the mere act of putting trainees together would be an important facilitator." (P13)

A nurse commented about the perceived investment in maintaining a siloed system:

"I mean, there are so many areas like this that represent challenges, but we also have people who are very, very established as physicians who have vested interests in keeping things as such, as they can, and adding people who are PA's and nurse practitioners and

drawing into our own little silo and keeping things as much as they can, the more we can get together and the more we can grow together and work together.” (P9)

Among others, a physician commented about “turf” issues that might lead to professional isolation:

“But I just think to facilitate takes an attitudinal change that nobody’s trying to get on anybody else’s turf. It’s just that we want to work together to accomplish the same thing, we all want to accomplish health for the patients.” (P6)

5. Change

Participants recounted their experience with change in the system. Many reported that change was happening. The system was already beginning to incorporate IPE and practice. Others reported resistance to change as part of keeping the cultural status quo. Some participants recounted the history of healthcare professionals in the United States, and the need to understand that history, but at the same time the need to move away from the way things had always been done. Others pointed to specific gender issues and the need to change rigid expectations that gender drives roles, responsibilities and behaviors.

Recognizing the change that has occurred in her practice over time, one physician said:

“It’s regulated now, that you can’t do kidney-when I first started, kidney transplant was done with a medical doctor like myself, a surgeon who put in the organs, and there were nurses that came and went into the program. A lot of them didn’t stay. You could never do it that way anymore. It just would not be acceptable. I mean, the program was so small then, compared to what it is now. But it also has grown in that area, as an

appreciation, as many of the fields have, that you cannot give good care unless you have a team.” (P1)

Supporting change in the hierarchical system, one physician said:

“Another step up and say okay, the time is right now to talk about power in the hierarchy. The nursing- physician hierarchy. It’s okay. We’re ready. We’ve been doing this now for so many years that we’ve got this seasoned group of faculty. We can address this issue. That is an outstanding issue that has never been addressed.” (P5)

One nurse practitioner describes the changing role of the nurse practitioner, but the barriers that still exist:

“I think as a nurse practitioner, and having worked for many, many, you know, for several decades, there’s been quite a transition in, you know, the inception of the NP role and the willingness for providers to see us as more than mid level providers. MLPs. “

“So, you know, I think the role of the nurse practitioner has morphed but I think that there are a lot of barriers and that we still have to overcome.” (P7)

6. Interprofessional work and patient care

Many participants believed that IPE and/or collaboration could improve patient care. Others talked about experiences with poor interprofessional interactions and how that might impact care.

One nurse said:

“You have a separate professional practice, which is nursing and together you have interdisciplinary collaboration, you know, to improve patient care and quality care.”(P9)

A physician recalled a very specific experience in which interprofessional work led to improved patient care.

“So I’m thinking about a circumstance in which a psychologist and I together worked to manage the care of a patient who had very, very severe depression. Life threatening depression, and the psychologist provided the expertise from his psychotherapy experience with the patient, and I provided my knowledge and background in psychopharmacology, and we teamed together to help this patient through an incredibly difficult and life threatening situation which had a very positive outcome that occurred, I think, because of our ability to collaborate around this patient.” (P16)

7. Perception of teams

Almost every participant discussed perceptions of teams, what makes good teams and the importance of team function in the care of patients. Many connected good team functioning with good interprofessional working relationships.

One doctor described why teams are needed in the current healthcare system.

“To me, what’s motivating our medical school is the recognition that medicine and medical care is mostly team based. That the complexities of clinical care require multiple people with various expertise and points of view and also that a lot of the aspects of clinical care are specialized because there’s so much knowledge within each particular area. So it’s hard for one person to know it all and be able to do it all.” (P16)

Discussing her view of teams and the importance of IPE, a nurse said:

“I am 100% convinced that the best care is team care and the only way you’re going to get people to practice in teams really collaboratively is to train them to do that. It’s really hard later.” (P17)

Connecting the teamwork to patient care, another nurse said:

"I'm a patient and I go in the hospital, what is it that's going to make my outcome better than anything else? And I don't think patients know this. It's the team. If the team works together, if the team is in sync, if the team gets along, if each part of that team, the patient care decision making, overseeing, watching out for, if that comes together like a charm, I'm going to get the best care in the world. If that team is dysfunctional. If that team doesn't get along, If that team doesn't respect each other, I as the patient am going to get shitty care. And the patient doesn't know that. But that's key." (P5)

IV. ENABLING FACTORS

A. Forces

1. Outside recommendations/mandates

Beyond the cultural context, participants discussed forces that they believed to be facilitators or barriers for IPE. Many referred to outside recommendations from organizations, ranging from respected international organizations such as the World Health Organization to national accreditation bodies. Many felt that these organizational recommendations were helping to move institutions forward in establishing some type of IPE.

One Physician Assistant said:

"I don't know if somebody has mentioned that, but the board that licenses physician assistants has got certain competencies that it expects." P3

Another physician assistant pointed out that accreditation bodies have many requirements and that it was important to make sure adding IPE did not exclude achievement of one of the other requirements.

"I think any changes that we would propose would have to go through our curriculum committee and then, of course, accreditation standards come into play that, you know, there are certain things that, you know, we have to teach. So if it meant, interprofessional training meant that we didn't have time to teach this, you know, we'd have to have lots of discussion about that." (P13)

Several nurses commented, with some skepticism, that these forces were finally bringing physicians to the table in this discussion, perhaps showing some resentment that it has taken outside mandates to force physicians to do it.

"I mean the only reason I think, quite frankly, that you're at the table right now and I'm saying you as medicine, is IOM is making you. You tell me that medicine would be at the table if the Institute of Medicine didn't talk about the fact that safety is compromised in the United States because we do not have interprofessional collaboration." (P9)

2. Local champions

Many recognized that international and national recommendations would not necessarily lead to meaningful change at the local level. Some discussed experiences with local champions, such as faculty with a particular interest in IPE or student demand for IPE, as important forces creating real change at their institution. Others discussed the need for administrative buy-in at the local level in order to effect change.

As an example, one physician said:

"It's all about individuals who want to do it. It's people getting together and saying this is something that's important to us." (P4)

Another physician talking about the power of individuals to make change said:

"So how everything works around here is your personal power. Your personal power, if you know people you can make meetings and you can start to talk about things." (P9)

A nurse describes the importance of individuals in this way:

"Commitment, commitment, commitment. That people have to be committed to it." (P17)

In addition to individual champions at the local level, this nurse pointed out the critical importance of champions in the administration. Without this support, a previously successful course was removed from the curriculum.

"The previous course which had been required in two schools, one of the reasons that it kind of faded out, besides the fact that the physician-the other two faculty left- was

because the School of Management had a change of leadership and no longer wanted to have this kind of material and so we were gone.” (P2)

3. Resources

According to many participants, the availability of resources (faculty time, large enough classrooms, funding) played an important role in the ability to implement IPE. The funding could be from local sources or national sources. It could be from grants, or from the schools in acknowledgement of the importance of the establishment of IPE. It could come in the form of direct funding or faculty support of time to devote to the effort.

One nurse talked about the funding as well as the time it would take to switch to an interprofessional model of education:

“And then in a era when, you know, financial resources are strained, you know, it makes it that much more difficult because, you know, people want to just teach the way they’ve always taught and don’t want to take the time to learn new approaches” (P17)

Another nurse discussed the possible financial drain on the system of such a program:

“...you know, integrating I think there are-the recipients need to see that-the stakeholders need to see that there’s something in it for them so that the resources that we would provide would be favorable and not depleting or draining the entire system.” (P9)

B. Curriculum

1. Logistics

Most faculty participants discussed logistical challenges in establishing an IPE program. Problems ranged from scheduling to the differing competence levels of the trainees.

Summing up the logistical barriers, one medical school faculty member said:
"....the structure of education is a barrier to interprofessional education. What I mean by this is that medical schools have their distinct curriculum. Nursing schools have their distinct curriculum. PA programs have their distinct curriculum and so finding ways to bring education from three different perspectives with three distinct curriculums is a barrier." (P13)

One physician was not concerned so much with the idea of IPE but more with the logistics of how it would be possible:

"To me the only down side is the logistics and it is not for-in my mind-for the philosophy of it, it's got to do with how are you going to make it work?" (P1)

Several participants mentioned that making courses elective was easier than making them required.

"I guess if you don't have to sell the course to somebody who either doesn't think students need to burden themselves with this material or have some other hoops that they want to put in the way, then it's way easier to get something going." (P2)

A physician assistant, along with several others, commented that the differences in the skills of the students can make joint teaching difficult:

"So since the requirements to get into professional schools are different, people come with different backgrounds and different experiences and sometimes we find it's difficult to combine those people in the same group." (P3)

2. Faculty development

Many participants commented that faculty development would be an essential component to any successful IPE program. Some participants, including this nurse, commented that some faculty would not necessarily be good choices for participation in an IPE program because of their views of interprofessional collaboration:

"I mean I do have colleagues, physician colleagues, who really like to be the captain of the ship. They think they know everything. But they're not going to be the right people to lead this kind of an issue." (P2)

A faculty member at the medical school also expressed concerns about finding enough faculty members who would be qualified to teach in such a program.

"So if you have a physician who is used to being a guy or gal who throws things and screams at nurses and, you know, dismisses PAs, they're not going to be a very good mentor in an interprofessional curriculum, because they're going to carry those biases and I'm not sure as a profession, the medical profession, whether it's-by medical I mean including nurses and PAs-that there are enough appropriate mentors everywhere to create the faculty you need to do-you know, a lot of the-I think the interprofessional stuff has to do with small groups. How do you make small groups, small teams function effectively?" (P13)

3. Establishment of joint goals

Many participants referred to knowledge and skills that overlapped for nurses, PAs and physicians, that would make natural joint goals. One nurse said:

"I mean I think we've got different roles in that, but I think physical assessment is one course that we're all learning the same thing. I mean a heart murmur is a heart murmur."

(P5)

Similarly, a physician said:

"There is so much shared curriculum that we teach and probably, for all I know, the nursing school is teaching some stuff a heck of a lot better than we're teaching it in the medical school and I'd love to know even what they're doing. I would love for there to be more built- in opportunity for coeducation." (P6)

V. REINFORCING FACTORS

A. Interprofessional experiences

1. Job satisfaction

A number of participants discussed their increased job satisfaction through their interprofessional work. This work ranged from joint patient care to research endeavors. One nurse described her experience teaching an elective with other healthcare professional faculty members:

"We got along really, really well because all of us sort of found it enriching to be with each other and I think we produced an interdisciplinary, interprofessional education that was very rich." (P2)

A physician also commented that he enjoyed working with people from other professions:

"... I would say is camaraderie. It's just more fun to work in a team with different kinds of people. All who care about patient care but have a unique or different perspective. So it makes the work more enjoyable. It's not why you do it, but it is a good part of this." (P15)

2. Personal experiences

Almost all participants commented about their personal experiences in interprofessional work, especially in the clinical setting, focused on the joint care of patients. Some experiences were good and others were not. Most physicians recounted stories about experiences with nurses during their residency training. One physician recounted an embarrassing experience on a call night when she was supposed to go to a code:

"I could think of ones where, you know, where the nurses would yell at me for not doing things right and I found that like so painful—the first time I was on call in an ICU. I went to sleep in my underwear and then they called, you know, the bell was ringing that somebody's heart stopped or one of the code and like I was trying to decide, you know, do I go out in my underwear. Like it was so stupid, but nobody even told me what to wear when I went to bed. You know, what do I, like, put clothes on? You know what I mean? And they're like banging on the door and that head nurse. I can't even remember what happened to the patient. I don't think the patient made it but I don't think it had anything to do with whether I came out or not. She was like screaming at me." (P1)

Other physicians marveled at the knowledge of the nurses, particularly in the ICU setting, and discussed how much they helped them take care of patients. One physician said:

"So the ICU nurses knew ICU medicine incredibly well and they knew things that the renal fellows that I was working with might not know and the dialysis nurses knew everything about dialysis. So a lot of—because they focused and because they were 100% clinical, they quickly came to know their niche and then they'd stay there for 30 years. So they really knew that niche, whereas a lot of the MDs would kind of rotate through, so that they might have had a lot more education in school but they didn't know that niche as well as the nurses do." (P16)

3. Career

Several participants commented about their careers and promotion. Some wondered whether participation in IPE would be helpful for career advancement in an academic setting. One nurse said:

“And the changing would happen by throwing some resources at it but also by all of us fixing our promotion and tenure criteria so that either there is an incentive to do inter-professional work which you could build into such a system or at least it’s recognized and rewarded and not dismissed as not being kind of central to the discipline.” (P2)

VI. DISCUSSION

This research is part of a needs assessment to help us build a successful interprofessional curriculum at Yale School of Medicine. Through these interviews and qualitative analyses, we have learned that faculty perceptions of interprofessional work and education is complex, which explains, at least in part, why implementing interprofessional curricula has been a challenge in many places. Like other researchers, we found that clinical settings and hospital systems are complicated cultures, as are the relationships between healthcare professionals. We discovered barriers in our own cultural context that were similar to those outlined by Baldwin above. (11) Using Kern's framework for curriculum development, we have developed a taxonomy for thinking about our findings as predisposing, enabling or reinforcing factors. We can then use this taxonomy to inform our curriculum development and design. (1)

Some of the issues identified through this research would be difficult to change. For example, it is impossible to change previous experiences that healthcare providers have had with each other that may serve to reinforce biases against interprofessional collaboration and education. It would be possible, however, to improve interprofessional interactions going forward. How, then, can we take what we have learned from faculty about IPE to create change that will make acceptance and success of an interprofessional curriculum possible?

Kotter developed a model for change that, in the context of our findings, can help guide specific steps for design and implementation of curricula. (2) Kotter emphasizes that change is a process, not a single event. As a first step, we should create a sense of urgency

for change. (2) Based on our findings, we can use forces, such as recommendations from outside organizations and accreditation bodies, to help stakeholders understand that change must happen. Key faculty and others should be reminded that accreditation bodies are now requiring IPE as part of their standards. (17)

As Kotter also points out, and as we have learned from our research, for true change to occur, it is essential to identify leaders, or champions, to bring the initiative forward. Leaders are in positions to establish the urgency for change. (2) We also learned that for the leader to be successful, there must be support from administration. Deans and program directors from the various healthcare professional schools must be brought into the process, early, for ultimate success. The likelihood of success is higher if 75% of those running these education programs agree that “business as usual is totally unacceptable”. (2) In addition, the leaders of change must role model the change they want. In our research we learned from faculty about good and bad examples of IPE and collaboration. To be successful change agents, the leaders must model the ideal outcome of the curriculum, successful interprofessional collaboration.

Another essential step will be creating a vision that can be understood by all stakeholders. (2) In our study, faculty raised many questions about how, when and where students would learn together. Many wondered about joint goals of the curriculum and about whether faculty would be prepared to teach in a setting with students from multiple professional schools. Those developing these curricula should formulate clear objectives, develop learning activities consistent with the objectives, and design assessments and faculty development programs that are easy for others to understand and to use.

Also during the interviews, some faculty expressed skepticism about the possibility for change. To combat this skepticism, it will be important to have some data to document quick short-term successful outcomes related to the new curriculum. Kotter points out that “wins” should be actively sought, with very specific goals in mind. (2) For this reason, a pilot of the curriculum, with a relatively small group of students and faculty might be useful, to gain the support of key stakeholders. Students, for example, can be a powerful force to advocate for change. Student participation in a successful pilot program could garner support and may in fact work to expand the experience to include all students.

We learned that the healthcare setting at our institution continues to be hierarchical, and that despite many calls for change over many years, this change has been slow in coming. The last step in Kotter’s approach is to ensure that change is institutionalized. (2) To do this, we will need to show that our curriculum leads to the desired changes, including improved interprofessional collaboration and, ideally, to show that such change leads to improved patient care. Many of our participants noted that ultimately better patient care was the primary shared goal of all healthcare providers.

VII. REFERENCES

1. Kern DE, Thomas PA, Hughes MT. *Curriculum Development for Medical Education: A Six-Step Approach*. Baltimore: Johns Hopkins University Press; 2009.
2. Kotter JP. *Leading change: Why transformation efforts fail*. Harvard Business Review. January, 2007.
3. Lueddeke GR. *Transforming Medical Education for the 21st Century: Megatrends, Priorities and Change*. London: Radcliff Publishing Ltd.; 2012.
4. Cooke M, Irby D, O'Brien BC. *Educating Physicians: A Call for Reform of Medical School and Residency*. San Francisco, California: Jossey-Bass. 2010.
5. Thibault GE. The role of private foundations in addressing health care workforce needs. *Academic Medicine*. 2013; 88: published online.
6. Interprofessional Education Collaborative Expert Panel. Core competencies for interprofessional collaborative practice: Report of an expert panel. Washington, D.C.: Interprofessional Collaborative. 2011.
7. Institute of Medicine. *Crossing the quality chasm*. Washington DC: National Academy Press. 2001.
8. Mitchell PM, Wynia M, Goldon R, McNellis B, Okun S, et al. Core Principles and values of effective team-based healthcare. Discussion paper, Institute of Medicine. Washington, DC. 2012.
9. Reeves S, Goldman J, Burton A, Sawatzky-Girling B. Synthesis of systematic review evidence of interprofessional education. *J Allied Health*. 2010; 39: 198-203.
10. Reeves S, Zwarenstein M, Goldman J, et al: Interprofessional education: effects on professional practice and health care outcomes. *Cochrane Database Syst Rev*. 2008; 1: CD002213.
11. Baldwin DC. Some historical notes on intra and interprofessional education and practice in healthcare in the USA. *Journal of Interprofessional Care*. 2007; 21:23-37.
12. Rubenstein LZ, Josephson KR, Wieland GD, et. al. *NEJM*. 1984; 311; 1664-70.
13. Curry LA, Spatz E, Cherlin E, Thompson JW, Berg D, Ting HH, et al. What distinguishes top-performing hospitals in acute myocardial infarction mortality rates? A qualitative study. *Ann Intern Med*. 2011;154:384-90.

14. Brock D, Abu-Rish E, Chiu C-R, et al. Interprofessional education in team communication: working together to improve patient safety. *BMJ Qual Saf*. 2013; 22: 414-433.
15. Frenk J, Chen L, et al. Health professionals for a new century: Transforming education to strengthen health systems in an interdependent world. *The Lancet*. 2010;376:1923-58.
16. World Health Organization Framework for Action on Interprofessional Education & Collaborative Practice http://www.who.int/hrh/nursing_midwifery/en/ Last accessed 1/6/14
17. Liaison Committee on Medical Education. http://www.lcme.org/new_standard_ed-19-a.htm. Last accessed 1/6/14.
18. Barker KK, Bosco C, Oandasan IF. Factors in implementing interprofessional education and collaborative practice initiatives: Findings from key informant interviews. *Journal of Interprofessional Care*. 2005; 19: 166-176.
19. Carlisle C, Cooper H, Watkins C. "Do none of you talk to each other?": the challenges facing the implementation of interprofessional education. *Medical Teacher*. 2004; 26: 545-552.
20. Rogers EM. *Diffusion of Innovations*. Free Press. New York, New York. 2003.
21. Charmaz K. *Constructing Grounded Theory: A Practical Guide Through Qualitative Analysis*. Sage Publications, Inc. Thousand Oaks, California. 2012.
22. Corbin J, Strauss A. *Basics of Qualitative Research*. Sage Publications, Inc. Thousand Oaks, California. 2008.

Eve R. Colson, MD
Professor and Chief, Section of Education
Department of Pediatrics
Yale Medical School

Education:

BA, Brown University, 1985, Magna Cum Laude, History and Biology
MD, Yale University School of Medicine, 1989
MHPE, University of Illinois, Chicago, 2014

Career/Academic Appointments:

7/2013-present	Professor of Pediatrics, Yale University School of Medicine, New Haven, CT
7/2005-6/2013	Associate Professor of Pediatrics, Yale University School of Medicine, New Haven, CT
9/1998-6/2005	Assistant Professor of Pediatrics, Yale University School of Medicine, New Haven, CT
8/1995-8/1998	Fellow, General Academic Pediatrics, University of Connecticut School of Medicine, Farmington, CT
7/1993-7/1995	Instructor in Pediatrics, University of Rochester School of Medicine and Dentistry
7/1992-6/1993	Chief Resident, University of Rochester School of Medicine and Dentistry, Rochester, NY
7/1989-6/1992	Pediatric Resident, University of Rochester School of Medicine and Dentistry, Rochester, NY

Administrative Positions:

2013-Present	Chief, Section of Education, Department of Pediatrics, Yale University School of Medicine
2012-Present	Component Director, Longitudinal Clinical Experience in the New Curriculum, Yale University School of Medicine.
2007-2013	Director of the Third-Year Curriculum, Yale University School of Medicine, New Haven, CT
2005-present	Director, Pediatric Clerkship, Yale University School of Medicine, New Haven, CT
2002-2005	Associate Program Director, Pediatric Residency Program Yale University School of Medicine, New Haven, CT
1998-2010	Director, Well Newborn Nursery, Yale University School of Medicine, Yale-New Haven Hospital, New Haven, CT

Board Certification:

American Board of Pediatrics, Pediatrics, 1993; Recertification 2000 and 2007

Professional Honors & Recognition:
International/National/Regional

2011: Josiah Macy Foundation Jr. Foundation Faculty Scholar

Chosen through a highly selective national process for accomplishments to date and future promise as an educational leader and innovator

Appointed to the Pediatric Test Committee of the National Board of Medical Examiners (NBME)

Appointed to the United States Medical Licensing Examination (USMLE) Step 2 Test Development Committee

2009: Consultant, National Institute of Health and Human Development to design national Safe Sleep Campaign

1993: Resident Teaching Award. University of Rochester School of Medicine and Dentistry

1985: Magna Cum Laude, Brown University

1985: Sigma Xi, Brown University

University

2010: Keynote speaker at the White Coat Ceremony celebrating the 200th anniversary of Yale School of Medicine.

2008: Alvan R. Feinstein Award given to that member of the faculty chosen as the outstanding teacher of the year of clinical skills. Yale University School of Medicine

2004: Leah Lowenstein Award presented to the faculty member who most clearly provides positive images of women in promoting humane and egalitarian medical education, Yale University School of Medicine

2003: Mae Gailani Junior Faculty Award in recognition of dedication to research and patient care, Department of Pediatrics, Yale University School of Medicine

2001: Howard Pearson Pediatric Faculty Teaching Award, Department of Pediatrics, Yale University School of Medicine

Grant History:**Current Grants**

Agency: Council on Medical Education in Pediatrics (COMSEP)

Title: Medical, Nursing and Physician Assistant Student Perspectives about Interprofessional Education

P.I. Eve Colson, MD

Total project costs per year: \$2,500 (with matching funds from Yale, Department of Pediatrics)

Project Period: 7/1/13-6/30/15

Agency: NIH/NICHHD

I.D.# 1 R01 HD072815-01

Title: Social Media and Risk-reduction Training of Infant Care Practices (SMART)

coP.Is.: Eve R. Colson, MD, Rachel Moon, MD, Fern Hauck, MD, Michael Corwin, MD

Percent effort: 15%

Direct costs per year: \$681,379 (year 1)

Total costs for project period: \$3,623,025

Project period: 10/01/12-09/30/17

Agency: Josiah Macy, Jr. Foundation Faculty Scholar

Title: Using the Continuities of Teaching, Patient Care and Interprofessional Education: An Innovative Clinical Curriculum at Yale

P.I. Eve R. Colson, MD (career award)

Percent effort: 50%

Direct costs per year: \$140,000

Total costs for project period: \$280,000

Project period: 09/01/11-12/31/13

Agency: NICHD

ID: U10-HD029067

Title: Study of Attitudes and Factors Affecting Infant Care (SAFE)

P.I. Michael J. Corwin MD

Role on Project: Co-Investigator; P.I. Yale Subcontract

Percent Effort: 20%

Direct costs per year: \$579,770 (year 1)

Total Costs per year: \$674,941 (year 1)

Project Period: 8/1/09-8/1/14

Past Grants

Agency: Northeast Group on Educational Affairs (AAMC)

Title: Identifying Beliefs about and Barriers to Interprofessional Education of Students: Perspectives of Academic Medical Center Faculty Members

P.I. Eve R. Colson, MD

Total costs for project period: \$5,000

Project Period: 01/01/12-12/31/12

Agency: American Academy of Pediatrics, Julius B. Richmond/Flight Attendant Medical Research Institute (FAMRI)

Title: Reducing Infants' Exposure to Secondhand Tobacco Smoke: The Role of Prenatal Stress in Resumption of Smoking by Mothers after Delivery

P.I. Isabelle Von Kohorn, MD (Fellow in Neonatology)

Role on Project: Mentor

Total project costs per year: \$24,000

Project period: 9/1/09-9/1/12

Agency: Council on Medical Student Education in Pediatrics (with match from Connecticut Children's Medical Center)

Title: Developing a Curriculum for Third-Year Medical Students Rotating in Pediatrics

P.I. Melissa Held, MD

Role on project: Mentor

Total project costs per year: \$2,500

Project Period: 8/1/07-8/1/09

Agency: Simons Foundation

Title: Prospective Study of the Development of Autism in Children.

P.I. Ami Klin, PhD

Role on project: consultant

Percent effort: 15%

Project period: 7/1/04-7/1/09

Agency: New Haven Department of Public Health

Title: Bed-sharing and Other Infant Care Practices among Inner-City Teens

P.I. Eve Colson, MD

Percent effort: 5%

Total project costs per year: \$12,700

Project period: 6/1/06-5/31/07

Agency: NIH, National Center for Research Resources

ID M01-RR06022

Title: Timing and Predictors of Smoking Relapse after Pregnancy

P.I. William Tamborlane

Role on Project: P.I. recipient of pilot funds

Total project costs per year: \$20,000

Project period: 12/1/02-11/30/04

Agency: Arthur Vining Davis Foundation

Title: Adopt-a-Doc

P.I. Brian Forsyth, MD

Role on project: Consultant

Percent effort: 5%

Total costs per year: \$168,516

Project Period: 9/1/02-8/31/04

Agency: NIH
 ID NS 42027-02
 Title: FMRI of Brain Development in Newborn Infants
 P.I. Laura Ment, MD
 Role on project: Consultant
 Percent effort: 10%
 Total costs per year: \$125,000
 Project period: 9/20/02-8/31/04

Agency: NIH/NIDA
 I.D. 1 P50 CA 84733
 Title: Tobacco Dependence and Risk Factors for Treatment Failure
 P.I. Stephanie O'Malley, PhD
 Role on project: Recipient of pilot funds for project: An Intervention to Prevent Women from Returning to Smoking after Pregnancy.
 Total costs per year: \$18,103
 Project period: 8/1/03-7/31/04

Invited Speaking Engagements, Presentations, Symposia & Workshops Not Affiliated With Yale

International/National

2013: Eunice K. Shriver National Institute of Child Health and Human Development.
 NICHD
 Researcher Perspectives-Podcast. November 4, 2013.

Pediatric Academic Societies Meeting. Washington, DC. Workshop leader. Delving Deeper into Qualitative Methods. Janice Hanson, Eve Colson, Su-Ting Li, Benjamin Siegel, Dorene Balmer, Tai Lockspeiser, Lindsey Lane, Andrea Asnes, Linda Tewksbury, Isabelle Von Kohorn.

Building an Understanding of Health-Related Behavior: The Case of Safe Infant Sleep. Invited Speaker. Maria Fareri Children's Hospital. Valhalla, New York. April 24, 2013.

Safe Infant Sleep: Data from the United States. Invited speaker. University of Otago, Dunedin, New Zealand. April 5, 2013.

2010: Webinar sponsored by the Association of SIDS and Infant Mortality Professionals and the Association of Maternal and Child Health Programs. Keynote speaker. Addressing racial disparities in infant sleep practice: New perspectives and recommendations.

International Conference on Perinatal Infant Death. Plenary speaker and panel discussant. An evolving story: Trends and factors associated with infant care practices in the United States. Washington, DC.

Pediatric Academic Societies Annual Meeting. Workshop. Using qualitative research to understand behaviors. Vancouver, BC.

- 2007: Hospital Reina Fabiola. Grand Rounds. El Síndrome del Muerte Súbita de Lactante (Sudden Infant Death Syndrome). Cordoba, Argentina.
- 2006: Academic Pediatrics Association Regional Meeting. Qualitative research: Letting participants tell you what is important. Putney, Vermont.
- 2005: First Candle/SIDS Alliance International Conference. Keynote speaker. The impact of poverty and race on SIDS rates. Washington, DC

Association of SIDS and Infant Mortality Program. Listening to caregivers: Understanding Barriers to following the back-to-sleep recommendations. Invited speaker. Washington, D.C.

Regional

- 2013: Middlesex Hospital Grand Rounds. Invited speaker. Interprofessional Education (IPE): Considering Teamwork, Collaboration and Beyond for Better Care of our Patients. Middletown, CT

Medical Education Day, Yale University School of Medicine. Invited Workshop. Education Scholarship that Counts for Your Career.

- 2011: Connecticut Safe Sleep Symposium. Keynote speaker. Back to sleep campaign and caregiver education: Lessons learned. Hartford, Connecticut
- 2009: Association of Yale Alumni in Medicine. Effective Strategies in Medical Education. New Haven, Connecticut.

Peer-Reviewed Presentations & Symposia Given at Meetings Not Affiliated With Yale International/National

- 2013: Schaeffer P, Myers JS, Warner M, **Colson ER**. Faculty perspectives about facilitators and barriers to interprofessional education (IPE) of healthcare students. Pediatric Academic Societies Annual Meeting. Washington DC.
- 2012: **Colson ER**, Willinger M, Rybin D, Heeren T, Lister G, Corwin M. Trends and factors associated with infant bed-sharing: The national infant sleep position study. International Conference on Stillbirth, SIDS and Infant Survival. Baltimore, Maryland.

Ali A, Millet J, Vitulano L, Lee, R, **Colson ER**. Health beliefs and experiences of patients with chronic lyme disease: A qualitative study. International Research Congress on Integrative Medicine and Health. Portland, Oregon.

Asnes AG, Schaeffer PA, **Colson ER**. What pediatricians advise parents about bed-Sharing. Pediatric Academic Societies Annual Meeting. Boston, Massachusetts.

Pediatric Academic Societies Annual Meeting. Boston. Workshop leader. Designing qualitative research.

Council on Medical Student Education in Pediatrics Annual Meeting. Indianapolis. Workshop leader. Just what do I want to study? Writing qualitative research questions and planning initial research design.

Council on Medical Student Education in Pediatrics Annual Meeting. Indianapolis. Workshop leader. Grant writing for success: The COMSEP small grant program and beyond.

2011: Pediatric Academic Societies Annual Meeting. Denver. Workshop leader. Designing qualitative research.

Pediatric Academic Societies Annual Meeting. Denver. Workshop leader. Scholarship of education: How to write compelling abstracts.

Council on Medical Student Education in Pediatrics Annual Meeting. San Diego. Workshop leader. Focus your vision for the future: Scholarship in pediatric medical education.

Colson ER, Dryer B, Hanson J, Tewksbury L, Flores G. Qualitative abstracts submitted to the PAS meeting: Are they less likely to be accepted for presentation? Pediatric Academic Societies Annual Meeting. Denver, Colorado.

Tewksbury L, **Colson ER**, Hanson J, Flores G, Dreyer B. Does reviewer expertise matter? Ratings of qualitative research abstracts submitted to the 2010 PAS meeting. Pediatric Academic Societies Annual Meeting. Denver, Colorado.

Von Kohorn I, Corwin MJ, **Colson ER**. Bed sharing and pacifier use among infants receiving WIC services. Pediatric Academic Societies Annual Meeting. Denver, Colorado

Fenick AM, Rybin D, Corwin MJ, **Colson ER**. Factors associated with breastfeeding among mothers at WIC centers. Pediatric Academic Societies Annual Meeting. Denver Colorado.

Tewksbury LR, **Colson ER**, Hanson J, Flores G, Dreyer B. Reviewer expertise effect on ratings of qualitative research abstracts submitted to the 2010 PAS Meeting. Council on Medical Student Education in Pediatrics Annual Meeting. San Diego, California.

Held M, Christy C, **Colson ER**. Barriers to assessing and remediating professionalism. Council on Medical Student Education in Pediatrics Annual Meeting. San Diego. Recipient of Poster Presentation Award in recognition of exemplary presentation.

- 2010: **Colson ER**, Held M. How to define, teach and evaluate professionalism: Input from focus groups with medical students, residents and faculty. Academic Pediatric Association Regional Meeting. Providence, Rhode Island.

Colson ER. Infant sleeping position, bed sharing and pacifier use in a population at high risk for SIDS in the United States. International Stillbirth Alliance and International Society for the Study and Prevention of Infant Death joint meeting. Sydney, Australia.

- 2009: Council on Medical Student Education in Pediatrics Annual Meeting. Baltimore. Workshop leader. How to develop a successful curriculum using professionalism as an example.

Bechtel K, Le K, Martin K, **Colson E**. Impact of an educational intervention on Caregiver knowledge of shaken baby syndrome and attitudes toward infant crying. Pediatric Academic Societies Annual Meeting. Baltimore, Maryland.

Held M, Chapman R, **Colson ER**. How to Define, evaluate and teach professionalism: Using focus groups as the initial steps in building a professionalism curriculum for third-year Students. Pediatric Academic Societies Annual Meeting. Baltimore, Maryland.

Von Kohorn I, Smith LA, Colton T, Lister G, Corwin MJ, **Colson ER**. African-american mothers are less likely to receive the “back to sleep” message from the media. Pediatric Academic Societies Annual Meeting. Baltimore, Maryland

- 2008: Conroy KN, Smith LA, **Colson ER**, et al. Do competing household priorities in low-income families affect adherence to AAP recommended sleep practices for infants? Pediatric Academic Societies Annual Meeting. Honolulu, Hawaii. Held M, **Colson ER**. How to define and assess professionalism: Input from focus groups with medical Students, residents and faculty. Council on Medical Student Education in Pediatrics. Atlanta, Georgia.

- 2007: Fu Linda, **Colson ER**, Corwin MJ, Moon R. SIDS Risk factors and safe sleep practices among diverse populations. American Public Health Association Annual Meeting. Washington, D.C.

Colson ER, Smith LA, Colton T, Lister G, Rybin D, Corwin MJ. Racial disparity and excess deaths among black infants: Still in the non-supine position for sleep. Pediatric Academic Societies Annual Meeting. Toronto, Canada.

Smith LA, **Colson ER**, Colton T, Lister G, Rybin D, Corwin MJ. Parental assessment of physician qualification to give advice of AAP targeted infant care practices related to SIDS. Pediatric Academic Societies. Toronto, Canada.

- 2006: **Colson ER**, Rybin D, Levenson S, Colton T, Lister G, Levenson S. Infant sleeping position, pacifier use and bedsharing: The national infant sleep position study. Pediatric Academic Societies Annual Meeting. San Francisco, California.

Colson ER, Rybin D, Levenson S, Margolis A, Colton T, Lister G, Corwin MJ. How advice affects choice of infant sleeping position. Pediatric Academic Societies Annual Meeting. San Francisco, California.

- 2005: **Colson ER**, Levenson S, Rybin D, Calanios C, Margolis A, Colton T, Lister G, Fox K, Corwin MJ. Barriers to following the back-to-sleep recommendations. Pediatric Academic Societies Annual Meeting. Washington, DC.

- 2004: Kretschmar L, Margolis A, **Colson E**. Ten years of the Back-to-Sleep campaign: Position inner-city infants are placed to sleep. Pediatric Academic Societies Annual Meeting. San Francisco, California.

Kretschmar L, Colson ER, Fox K, Lister G, Levenson S, Colton T, Corwin M. Barriers that interfere with adherence to the back-to-sleep recommendations: Focus groups of inner-city caregivers. Pediatric Academic Societies Annual Meeting. San Francisco, California.

Colson ER, Batten, SV, Margolis A, Letourneau A, Shapiro E, Hurd S. Timing and Predictors of Returning to Smoking after Pregnancy in a Group of Inner-City Women. Pediatric Academic Societies Annual Meeting. San Francisco, California.

- 2003: **Colson ER**, Moreno LP, Allen K, Banyas B, Maldonado I, Teague B. Positions inner-city parents place their infants to sleep at the 2-4 month health supervision visit. Pediatric Academic Societies Meeting Annual Meeting. Seattle, Washington.

- 2004: **Colson ER**, Batten SV. Smoking during and after pregnancy in an inner-city setting. Presented at the Pediatric Academic Societies Annual Meeting. Seattle, Washington.

- 2002: **Colson ER**, Moreno LP. A nursery intervention keeps inner-city infants on their backs to sleep. Presented at the Annual Pediatric Academic Societies Meeting. Baltimore, Maryland.

- 2001: **Colson E**. An educational intervention gets inner-city infants on their backs to sleep. Pediatric Academic Societies Meeting. Baltimore, Maryland

Colson E, Bergman D, Shapiro E, Leventhal, J. Not yet "Back-to-Sleep": Associations between infant sleep position and nursery practice in an inner-city setting. Pediatric Academic Societies Meeting. Baltimore, Maryland.

2000: **Colson E**, Bergman D, Shapiro E, Leventhal, J. Not Yet “Back-to-Sleep”: Associations between infant sleep position and nursery practice in an inner-city setting. Society for Developmental and Behavioral Pediatrics Annual Meeting. Providence, Rhode Island.

1998: **Colson E**, Bernstein B, Schechter N, King S, Pachter L, Dworkin P: Do we really have a choice?: Issues facing inner-city parents considering stimulant medication. Society for Developmental and Behavioral Pediatrics Annual Meeting. Cleveland, Ohio.

Colson E, Stille CJ, Payton J, Bernstein B, Dworkin P: Not yet “back to sleep”: Infant sleep position in two inner-city clinics. Annual Meeting of the Society for Developmental and Behavioral Pediatrics Annual Meeting. Cleveland, Ohio.

Professional Service:

Peer Review Groups

2012	Invited mentor for fellow abstract reviewers, Pediatric Societies Annual Meeting
2009-Present	Abstract reviewer for annual meeting Council on Medical Student Education in Pediatrics
2009-Present	Workshop reviewer for annual meeting Council on Medical Student Education in Pediatrics
2008-Present	Abstract reviewer for Pediatric Academic Societies Annual Meeting
2008-Present	Workshop reviewer for Pediatric Academic Societies Annual Meeting

Journal Service:

Editorial board

July 2013- Present *Academic Pediatrics*

2002-2012 *Birth*

Reviewer

2000-present reviewer for *Pediatrics*, *Jama Pediatrics*, *Academic Pediatrics*, *Maternal-Child Health Journal*, *Birth*, *Journal of Adolescent Health*

Professional Service for Professional Organizations:

2012- Present	Co-Chair, Qualitative Research Special Interest Group, Academic Pediatrics Association
2010-Present	Member, Executive Research Committee, Academic Pediatrics Association
2009-Present	Member, Research Task Force, Council on Medical Student Education in Pediatrics
2004- 2006	Elected Region I Co-Chair, Academic Pediatrics Association

Yale University Service:

Medical School Committees

2013-present Member, Dean’s Executive Committee for Curriculum Rebuild

2012-present	Chair, Longitudinal Clinical Experience Curriculum Development Task Force
2012-present	Member, Physician Associate Director Selection Committee
2010-2012	Member, Liaison Committee, Pediatric Chair Selection, Yale Medical School
2009-Present	Member Strategic Planning Committee, Yale Medical School
2007-Present	Chair, Curriculum Review Committee, Yale Medical School
2007-Present	Chair, Clerkship Director Committee, Yale Medical School

Bibliography:

Peer-Reviewed Original Research

1. **Colson ER**, Horwitz RI, Bia FJ, Viscoli CM. Zidovudine (AZT) for treatment of patients infected with human immunodeficiency virus type 1. An evaluation of effectiveness in clinical practice. *Archives of Internal Medicine*. 1991;151:709-713.
2. **Colson ER**, Stille CJ, Payton J, Bernstein B, Dworkin P. Not yet back to sleep: infant sleep position in two inner-city clinics. *Ambulatory Child Health*. 2000;6:269-275.
3. Anderson AW, Marois R, **Colson ER**, Peterson BS, Duncan CC. Neonatal auditory activation detected by functional magnetic resonance imaging. *Magnetic Resonance Imaging*. 2001;19:1-5.
4. **Colson ER**, Bergman D, Shapiro E, Leventhal J. Position for newborn sleep: Associations with parents' perceptions of their nursery experience. *Birth*. 2001;28:249-253.
5. **Colson ER**, Joslin SC. Changing nursery practice gets inner-city infants in the supine position for sleep. *Archives of Pediatric and Adolescent Medicine*. 2002;717-720.
6. Peterson BS, Anderson AW, Ehrenkranz R, Staib LH, Tageldin M, **Colson E**, Gore JC, Duncan CC, Makuch R, Ment L. Regional brain volumes and their later neurodevelopmental correlates in term and preterm infants. *Pediatrics*. 2003; 111: 939-948.
7. **Colson ER**, McCabe LK, Fox K, Levenson S, Colton T, Lister G, Corwin M. Barriers to following the back-to-sleep recommendations: Insights from focus groups with inner-city caregivers. *Ambulatory Pediatrics*. 2005;5:349-354.
8. Benin AL, Wisler-Scher DJ, **Colson E**, Shapiro ED, Holmboe ES. Qualitative analysis of mothers' decision-making about vaccines for infants: the importance of trust. *Pediatrics*. 2006;117:1532-47.
9. **Colson ER**, Levenson S, Rybin D, Calianos C, Margolis A, Colton T, Lister G, Corwin MJ. Barriers to following the supine sleep recommendation among mothers at four WIC centers. *Pediatrics*. 2006;118:e243-50.
10. Letourneau AR, Batten S, Mazure CM, O'Malley SS, Dziura J, **Colson ER**. Timing and predictors of smoking in a group of inner-city women: An exploratory study. *Birth*. 2007;34:245-52.
11. Wu AC, Wisler-Sher DJ, Griswold K, **Colson E**, Shapiro ED, Holmboe ES, Benin AL. Postpartum mothers' attitudes, knowledge and trust regarding vaccination. *Maternal Child Health Journal*. 2008;12: 766-73.
13. Fu LY, **Colson ER**, Corwin MJ, Moon RY. Infant sleep location: Associated maternal and infant characteristics with sudden infant death syndrome prevention recommendations. *Journal of Pediatrics*. 2008; 153: 503-508. PMC3903790
14. **Colson ER**, Rybin D, Smith LA, Colton T, Lister G, Corwin MJ. Trends and factors associated with infant sleeping position: The national infant sleep position study, 1993-2007. *Archives of Pediatric and Adolescent Medicine*. 2009;163:1122-28.

15. Von Kohorn I, Corwin MJ, Rybin DV, Heeren TC, Lister G, **Colson, ER**. Influence of prior advice and beliefs of mothers on infant sleep position. *Archives of Pediatric and Adolescent Medicine*. 2010;164:363-369.
16. Smith LA, **Colson ER**, Rybin D, Margolis A, Colton T, Lister G, Corwin MJ. Maternal assessment of physician qualification to give advice on AAP recommended infant sleep practices related to SIDS. *Academic Pediatrics*. 2010; 10: 383-388.
17. Bechtel K, Le K, Martin K, Shah N, Leventhal J, **Colson, E**. Impact of an educational intervention on caregivers' beliefs about infant crying and knowledge of shaken baby syndrome. *Academic Pediatrics*. 2011; 11: 481-486.
18. Von Kohorn I, Nguyen SN, Shulman-Green D, **Colson ER**. A qualitative study of postpartum mother's intention to smoke. *Birth*. 2012; 39:65-69.
19. Nguyen SN, Von Kohorn I, Shulman-Green D, **Colson ER**. The importance of social networks on smoking: Perspectives of women who quit smoking during pregnancy. *Maternal Child Health Journal*. 2012 Aug;16(6):1312-8.
20. Lister G, Rybin D, Colton T, Heeren TC, Hunt CE, **Colson ER**, Willinger M, Corwin MJ. The relationship between sleep position and risk of extreme cardiorespiratory events. *Journal of Pediatrics*. 2012;161:22-25.
21. Meharry P, **Colson E**, Grizas A, Stiller R, Vazquez M. Why women accept or reject the trivalent inactivated influenza vaccine (TIV) during pregnancy. *Maternal Child Health Journal*. 2013;17:156-64.
22. **Colson ER**, Dreyer BP, Hanson JL, Tewksbury L, Johnson M, Flores G. Qualitative abstracts at the Pediatric Academic Societies Meeting: Are they less likely to be accepted for presentation. *Acad Pediatr*. 2013;13:140-144.
23. **Colson ER**, Willinger M, Rybin D et al. Trends and factors associated with infant bedsharing, 1993-2010: The national infant sleep position study. *JAMA Pediatr*. 2013; 167: 1032-7.

Chapters, Books and Reviews

24. Colson E, Herendeen N, Szilagyi P. Index of suspicion. Case 1. Rickets. *Pediatrics in Review*. 1996; 17: 319-21.
25. Colson E, Dworkin PH. Toddler Development. *Pediatrics in Review*. 1997;8:253-257.
26. Schechter NL, Reis S, Colson E: The Gifted Child. In M Levine, W Carey, A Crocker (Eds.): *Developmental-Behavioral Pediatrics*, 3rd edition, Philadelphia, W.B. Saunders Company, 1999.
27. Colson ER, Herendeen N, Szilagyi P: Decreased Growth Rate and Slightly Thickened Wrists in an Infant. In L Nazarian (ed): *Challenges in Pediatric Diagnosis*. Elk Grove Village, Illinois, American Academy of Pediatrics. 2000.
28. Colson ER, Theirfelder F, Senturias Y. Normal Preschool and School Age Development. In Robert Berkow (ed): *The Merck Manual Home Edition*. Merck and Co.,Inc. Whitehouse Station, NJ. 2003
29. Bizzarro MJ, **Colson ER**, Ehrenkranz R. Differential Diagnosis and Management of Anemia in the Newborn. *Pediatric Clinics of North America*. 2004; 52:1087- 107.
30. **Colson ER**, Chapman RL. Approach to the Care of Normal Infants and Children. In Robert Porter (ed): *The Merck Manual of Diagnosis and Therapy* 18th Edition. Merck & Co., Inc., Whitehouse Station, NJ. 2006

31. **Colson ER**, Chapman R. Perinatal Physiology. In Robert Porter (ed):The Merck Manual of Diagnosis and Therapy 18th Edition. Merck & Co., Inc., Whitehouse Station, NJ. 2006
32. **Colson ER**, Chapman R. Caring for Sick Children and their Families. In Robert Porter (ed):The Merck Manual of Diagnosis and Therapy 18th Edition. Merck & Co., Inc., Whitehouse Station, NJ. 2006
33. **Colson, ER**. Section Editor. Health Promotion and Disease Prevention. In C Rudolph, A Rudolph, George Lister, Lewis First, Anne Gershon (Eds): Rudolph's Pediatrics, 22nd Edition. McGraw-Hill. New York. 2010.