



Teaching Portfolio

Andrew M. Luks, MD

Division of Pulmonary and Critical Care Medicine
University of Washington School of Medicine



Section 1

Executive Summary
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Andrew M. Luks, MD Teacher's Portfolio Executive Summary

The pages that follow in this Teacher's Portfolio represent a compendium of the work I have done as a clinician-educator in the Division of Pulmonary and Critical Care Medicine from the second year of my fellowship through time as a faculty member. I believe very strongly in the "educator" component of my job description, a belief that is reflected in several facets of my work that will be apparent upon reading this portfolio:

- **Quantity of Teaching:** In addition to my heavy clinical load, I perform a large volume of education-related activities including direct teaching in a variety of formats, curriculum development and multiple course directorships.
- **Breadth of Teaching:** My work spans the gamut from medical students, who occupy the bulk of my teaching time, to residents, fellows and allied health professionals and reflects the emphasis I place on tailoring my teaching to the audience in front of me at any given time.
- **Quality of Teaching:** It will be apparent from my written and numerical evaluations and the teaching awards described in this portfolio that the high quantity and large breadth of my teaching are all marked by a high *quality* of work reflective of the high standards I set for myself and the effort I put into my teaching.

Beyond the quantity, breadth and quality of my teaching, the portfolio will also demonstrate a significant amount of scholarly activity. I have devoted a lot of time to the scholarship of synthesis, generating a large number of publications in the area of high altitude medicine and physiology, and have also focused considerable effort on making my work as an educator available for peer review and use by the wider medical education community. The portfolio will further reflect the maturation of my scholarship over time as I am not only writing article and chapter-length pieces on a regular basis but have also completed three book-length projects in the past three years.

All of the work described in the pages that follow, whether it be my direct teaching, my scholarship or my administrative roles grows out of a simple Teaching Philosophy developed over many years of observing other teachers and working with my own students. This philosophy, which is rooted in five basic concepts -- enthusiasm, flexibility, relevance, simplicity and evolution -- informs who I am as a teacher and continues to guide me in my work in the School of Medicine.

The bulk of the information necessary to gain a complete picture of my work and my dedication to my role as an educator is laid out in the 9 sections that follow this Executive Summary. Further information, including copies of my publications, complete evaluations and examples of teaching materials are available upon request (aluks@u.washington.edu).

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All photos in this portfolio were taken by Andrew Luks during the course of his travels in the wilderness.



Section 2

Personal Information

Section 2: Personal Information

Full Name: Andrew Mark Luks, MD

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Institutional Affiliation:

University of Washington

Current Position:

Associate Professor
Department of Medicine. Division of Pulmonary and Critical Care Medicine

Specialties

Pulmonary Medicine
Critical Care Medicine

Board Certification:

Internal Medicine. Certified 10/2013. Expires 10/2023
Pulmonary Diseases. Certified 11/2006. Expires 11/2016
Critical Care Medicine. Certified 10/2007. Expires 10/2017

Areas of Research and Clinical Interest:

Critical care medicine
High altitude physiology and medicine
Exercise physiology
Medical education

Work History

6/00-6/03: Internship and residency training. University of Washington
Affiliated Hospitals Internal Medicine Residency Training
Program. Supervisor: Findlay Wallace, MD

6/03-6/04: Chief Medical Resident. Puget Sound Veterans Health Care
System. Supervisor: Thomas R. Martin, MD

- 7/04-6/07: Fellowship training: University of Washington Affiliated Hospitals Pulmonary and Critical Care Medicine Training Program. Supervisor: Mark Tonelli, MD
- 7/07-6/08: Medical ICU Hospitalist. University of Washington Medical Center. Division Chief: Robb Glenny, MD; Hospitalist program supervisor: H. Thomas Robertson, MD.
- 7/08-Present Attending Physician. Medical ICU, Trauma-Surgical ICU, Neurosciences ICU. Harborview Medical Center. Division of Pulmonary and Critical Care Medicine. Department Chair: William Bremner, MD PhD; Division Chief: Robb Glenny, MD; Section Head: J. Randall Curtis, MD.

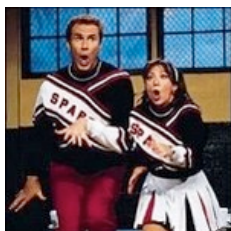
A scenic landscape photograph featuring a majestic, snow-capped mountain range in the background. The mountains are rugged, with sharp peaks and patches of snow and ice. In the foreground, a calm lake reflects the mountain's image, creating a mirror-like effect. The lake is surrounded by a field of dry, golden-brown grass. The sky is a clear, deep blue. The overall scene is serene and majestic.

Section 3

Teaching Philosophy

Section 3: Teaching Philosophy

My teaching philosophy developed out of a large number of opportunities to observe teachers from many disciplines and of many skill levels during my own long education. This philosophy, which strongly informs my efforts to teach and inspire others in the same ways that my best high school, college and medical instructors inspired me, is rooted in four central concepts that are best captured by the accompanying photos as metaphors.



Enthusiasm: When asked to describe my teaching approach, I immediately think of the Spartan Cheerleaders played by Will Ferrell and Sheri Oteri on Saturday Night Live. Enthusiastic to a fault, they could get excited about just about anything. While I am not as “over-the-top” in my teaching approach as these characters, I believe most of my students would say I bring a similar level of enthusiasm to my work. Learners thrive off the enthusiasm of the instructor and I put much effort into ensuring that there is never a day-off in my classroom.



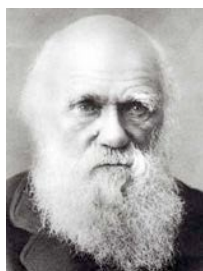
Flexibility: I strive to be as flexible as the beloved Gumby - adapting my teaching such that it is perfectly suited for my audience. I know that every learner is different and an explanation or approach that works for one learner may not work for another. Similarly, I know that I need to adapt my style to the different settings in which I teach – at the bedside or in large and small classrooms – and strive to be an effective, up-to-date teacher in all of these settings.



Relevance: Retention is better and interest is higher when learners see the relevance of material to the care of patients residing in beds such as the one in the photo. Medical students, for example, are more engaged when they know that the material will matter when they work on the wards. Similarly, bedside teaching is more effective when it reinforces previously learned concepts or reveals the clinical applications of seemingly unimportant details. I therefore anchor my teaching in things learners will see in their work and always focus on key concepts rather than unimportant minutiae.



Simplification: Much of what I teach in the classroom and at the bedside is conceptually difficult material that takes time and effort to grasp. It is for this reason that I am always looking for ways to break the complicated material into its basic components, which I then help the learner assemble into a coherent whole. When they understand the “lego blocks” underlying the concept, they have a greater appreciation for how the entire structure fits together.



Employing this philosophy in my role as an educator, I believe I have been able to inspire learners as my best teachers inspired me and have been recognized for my efforts. As I reflect on my experiences and future goals as an educator, I am often drawn to an image of Charles Darwin. While the core principles that got me to this point are unlikely to change in the years to come, I am not done evolving as an educator. The student I teach today does not care that I received a teaching award five years ago, as that fact does nothing to help them learn and retain material. Instead, they expect and deserve the best I have to offer at the time I am working with them and it is for this reason that I remain committed to never resting on my laurels and to continually improving my skills so my time in my classroom is always an invigorating, fruitful experience.



Section 4

Teaching Activities and Roles as an Educator

Section 4: Teaching Activities and Role as an Educator

Direct Teaching Activities

The pages that follow include documentation of my direct teaching activities within the School of Medicine. Numerical evaluation scores are provided where available, as are representative examples of written comments. Complete evaluations are available upon request.

Medical Student Education

I have the following roles in medical student education:

- **CPR (aka Circulatory Systems):**

This is one of the main blocks in the new medical student curriculum that will start in the 2015-2016 academic year. I was selected to be the overall block chair responsible for guiding the curriculum development process for the entire block as well as for creating and implementing the pulmonary component of the course. In this role I am coordinating work between faculty in Seattle as well as at the five regional sites where the curriculum will also be implemented. The course is currently under development and there is no evaluation material available for this work at this time.

- **HuBio 541: The Respiratory System**

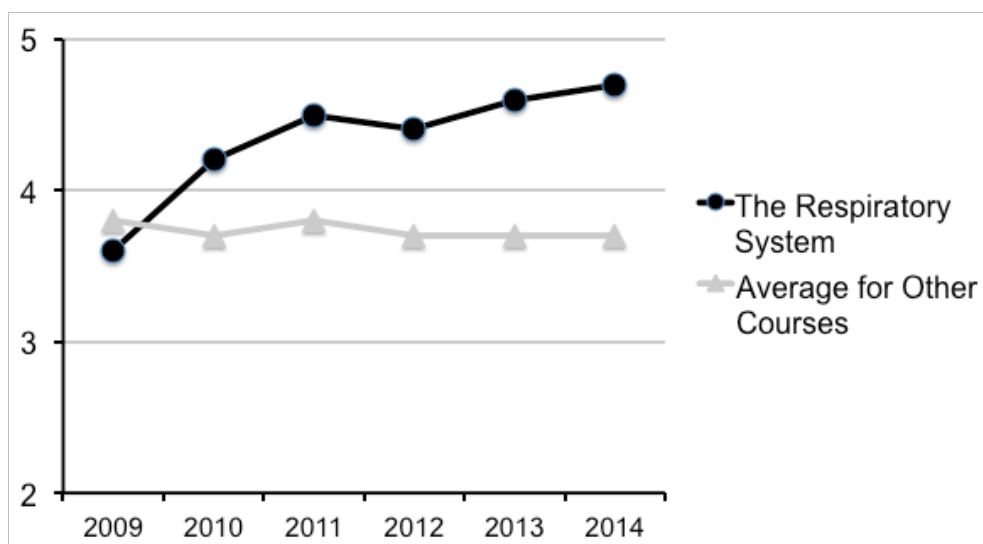
I have several major roles in the course including the following:

Course Chair

After serving as Co-course chair from 2010 to 2012, I became the sole Course Chair in 2013 and have remained in that role since that time. Over this five year period, I undertook and completed a major effort to revise all aspects of the course materials including the syllabus, small group materials, assessments, the course website and communications with the students. The overall course rating on a scale from 1 (poor) to 5 (exceptional) starting one year before my taking on a leadership role and continuing to this past year are displayed below.

2009	2010	2011	2012	2013	2014
3.6	4.2	4.5	4.4	4.6	4.7

The figure below displays the average course rating for HuBio 541 relative to the average for the other courses offered in the fall quarter during this same time frame.



Student ratings on a scale from 1 (poor) to 5 (exceptional) for my effectiveness as Co-course Chair and Course Chair since 2010 are displayed in the table below:

2010	2011	2012	2013	2014
4.8	4.6	4.8	4.9	4.9

A sample of written comments for my work as Course Chair include the following:

2013: "He is an excellent course chair. He is obviously invested in our learning. The course structure was very well organized and he communicated with us on a regular basis. It was obvious that he put in a great deal of time to make the course successful and I appreciate his investments." "Keep doing what you are doing! We have a joke among students that we are going to create a "med school all-star team" of professors and without a doubt you made the cut for the team! You are always available, quick to respond to questions and always working to make the course better. This work ethic and commitment to excellence is contagious and contributed to my success in the course for sure." "Andy Luks is a rarity in this school in his dedication, intelligence, and continual striving to improve his course. If more of our professors were like Andy, we would have a thousand fold better preclinical curriculum... His rapport with students demonstrated that he genuinely cared about his relationship with them and about imparting the material effectively....UWSOM should look toward his example as it tries to improve its curriculum.

2014: "Top-notch instructor. I am so impressed by the preparedness, consistently outstanding teaching, and responsiveness to the needs of the students. By far one of our best instructors so far!" "Dr. Luks is a creative, forward thinking, effective instructor. I have nothing bad to say about this class. Lectures were great. Expectations and requirements were clear. Best class since med school started, without question." "Dr. Luks (Andy...) has been a highlight of my medical school education. It is clear that he cares about his students above all else, and puts in lots of time to ensure they're learning. He makes an effort to remember students' names,

and checks in with students to see how they're doing. He does not make anyone feel like they have a stupid question, and takes the time to fully explain complex comments from the basics up. Just keep up the excellent work.” “Andy is phenomenal at what he does. What impressed me about him is his amazing ability to know everyone's name in the class; mostly because it showed he cared to know each one of us. Furthermore, he was probably the most organized professor I have ever had... or will probably ever have. Despite being one of the most difficult classes I have ever taken, I appreciate the work this man does. He is great!”

Complete copies of my complete evaluations are available upon request.

Course Lecturer: I give several lectures as part of the course each year. Numerical evaluations on a scale from 1 (poor) to 5 (exceptional) for my performance as a course lecturer, with comparison to the average for other lecturers, are as follows:

Dimension	2007	2008	2009	2010	2011	2012	2013	2014
Overall Effectiveness	4.3	4.5	4.5	4.8	4.6	4.8	4.9	4.9
Average Peer Scores	3.8	3.9	3.7	3.9	3.8	4.1	4.1	4.3

A sample of written comments for my work as a course lecturer include the following:

2013: “Andy's PowerPoint presentations were incredible. He should teach a course to all our other systems' chairs about how to make a PowerPoint.” “One of the best lecturers at this school, great organization, simple diagrams, easy to follow. It's evident he prepares for these lectures ahead of time and puts a lot of work into them.” “Clear and good highlighting of the main points. You walk us through the reasoning to get to the concepts we need to know. I felt like I understood the material in-depth without feeling overwhelmed. The best thing you could do now would be to coach your other lecturers to improve their teaching.”

2014: “His presentations were excellent. So well organized. He kept the lecture engaging at all times. He has truly mastered the art of teaching. Excellent PowerPoints.” “Dr. Luks was a fantastic lecturer! His presentations were fun, engaging, and clear. More importantly, he helped us actually think through the concepts we were learning about; he taught us how to think critically about respiratory cases, and not just regurgitate facts.” “Amazing lectures. Great pacing, great energy, great delivery. I have a ton of respect and admiration for Dr. Luks. He has obviously given his lectures multiple times because they went so smoothly but he delivered them like they were fresh with enthusiasm and energy. At some point in my life I imagine I will fall into a routine where I do similar things over and over professionally, if that happens I hope they will be the things I love to do and that I have the kind of energy and enthusiasm Dr. Luks had in presenting his lectures to us.”

A complete set of evaluations for my HuBio 541 lectures is available upon request.

Examples of the PowerPoint slide decks from two lectures I give as part of the course are provided below. The slides in these images represent only a portion of the slides used in each lecture.

HuBio 541 Lecture on Blood Gas Transport:

Our First Case: The Bleeding Mother

A 25 year-old gravida 1, para 1 woman delivers a baby girl at 37 weeks. Shortly after delivery, she develops significant post-partum hemorrhage. After her bleeding is finally controlled, her hemoglobin is 1 g/dL (normal: 15 g/dL) and her hematocrit is 4% (normal: 45%).

Our Second Case: The Dyspneic Oncology Patient

A 55 year-old man is taking dapsone for prophylaxis against pneumocystis pneumonia while being treated for leukemia. He develops dyspnea and is noted to have an $S_{a}O_2$ of 87% that does not improve with supplemental oxygen.

Hb: ABG (see supplemental slide)
 $P_{a}O_2$: 378

?

What has happened to the oxygen content of their blood?

How can you improve tissue oxygen delivery?

Oxygen Is Carried In Physical Solution

Henry's Law: The amount of a given gas dissolved in a volume of liquid is directly proportional to the partial pressure of that gas in equilibrium with that liquid

Oxygen In Physical Solution

$C = \alpha \times P$
 Concentration = Solubility \times Partial Pressure

Oxygen In Physical Solution

$C = \alpha \times P$
 Concentration = Solubility \times Partial Pressure

α at 37°C (ml O_2 /100 mL blood/mm Hg)	0.003
P (mm Hg)	~ 100
C (ml O_2 /100 mL blood)	0.3

Oxygen In Physical Solution

$C = \alpha \times P$
 Concentration = Solubility \times Partial Pressure

α at 37°C (ml O_2 /100 mL blood/mm Hg)	0.003
P (mm Hg)	~ 100
C (ml O_2 /100 mL blood)	0.3

Carrying Oxygen In Solution Is Not Sufficient

Basal Oxygen Demand ($\dot{V}O_2$)
 ~ 250-300 mL O_2 / minute

If oxygen was delivered in solution only cardiac output would need to be ~ 320 L/min to meet demand!!!

The Solution To The Oxygen Delivery Problem

Hemoglobin
 Iron-Containing Heme Group

Hemoglobin (Hb) Can Carry A Lot Of Oxygen

1.39 mL O_2 / gram Hb

Normal Blood: 15 gram Hb / 100 mL blood

Hb Carries: 20 mL O_2 / 100 mL blood (70 times more than carried in solution)

O_2 Binding Sites Are Not Filled To Capacity All Times

% Saturation = $\frac{\text{Actual Hb-}O_2 \text{ Content}}{\text{Total Hb-}O_2 \text{ Capacity}} \times 100$

This is often labeled as: $S_{a}O_2$ or $S_{v}O_2$

Oxygen Saturation Is A Function Of The PO_2

Hb- O_2 Dissociation Curve

We Describe The Affinity For Oxygen Using The P_{50}

Hb- O_2 Dissociation Curve

The Dissociation Curve Is Dynamic

Increased Affinity: Left shifted curve, Lower P_{50}
 Decreased Affinity: Right shifted curve, Higher P_{50}

Multiple Factors Shift The Dissociation Curve

Higher Affinity (Decreased P_{50})	Lower Affinity (Increased P_{50})
Increased pH	Decreased pH
Decreased PCO_2	Increased PCO_2
Lower Temperature	Higher Temperature
	Increased 2,3 DPG (Diphosphoglycerate)

The effect of increased PCO_2 is called the "Bohr Effect"

A Task For The Class: Changes in Hb- O_2 Affinity

Area of Interest	How Does Hemoglobin- O_2 Affinity Change?
Quadriceps muscle during exercise	$\uparrow P_{a}CO_2$ & temperature \downarrow pH leads to decreased affinity
The fetus in utero ($P_{a}O_2$ ~ 25 mm Hg)	Fetus has a lot of Hb-F with marked increase in affinity

Hemoglobin Has Affinity For Other Things

CO has 240 times the affinity for Hb as O_2

CO
 Carbon Monoxide

Out-compete O_2 for Hb binding sites

Leads to a "functional" anemia

The Non-CO-Bound Hb Has Higher Affinity for O_2

The result: Hb will not offload O_2 at the tissues!

Dissolved And Hb-bound O_2 Combine To Give Content

Bound to Hemoglobin
 Dissolved in Blood

Arterial oxygen content
 $C_{a}O_2 = (1.39 \times Hb \times S_{a}O_2) + (0.003 \times P_{a}O_2)$

Normal $C_{a}O_2$ ~ 20.5 mL O_2 / 100 mL blood (assuming $P_{a}O_2$ ~ 100 mm Hg)

Alveolar Ventilation

Andrew M. Luks, MD
Associate Professor
Division of Pulmonary & Critical Care Medicine
HuBio 541 The Respiratory System
November 5, 2014

Alveolar Ventilation

DISCLOSURE STATEMENT

Aside from the fact that he believes strongly in the importance of adequate ventilation, Dr. Luks has no commercial, non-commercial, or institutional financial interests or personal financial relationships to disclose regarding the material presented in this lecture.

Our Goal In Today's Lecture

To describe the first steps of oxygen delivery and the final steps of carbon dioxide elimination

We Will Use Two Cases To Frame The Lecture

Case #1: A 35-year-old woman is found in a bathroom at Pima Plaza Mall with an empty heparin syringe next to her. Her respiratory rate is 6 and she is taking shallow breaths.

Case #2: A 27-year-old man is brought into the ED complaining of chest pain. He appears nervous, diaphoretic and is breathing deeply at a rate of 30 breaths per minute.

? What will happen to alveolar oxygen and carbon dioxide tensions ?

An Outline For Today's Talk

- Some important terminology used in this lecture and throughout the course
- Gas pressures and the respiratory system
- The concepts of minute ventilation and dead space ventilation
- The determinants of alveolar carbon dioxide and oxygen tensions

Some Important Terminology

We Need To Start With Important Terminology

Term	Meaning	Units
P	Pressure or partial pressure	mm Hg
F	Fraction of a gas in a mixture	None
V	Volume of a gas	L or mL
\dot{V}	Volume per unit time	L/min or mL/min

Upper case subscripts refer to air spaces.
Lower case subscripts refer to vascular locations.

Some More Terminology

Subscript	Refers To	Example	Definition
I	Inspired	F_{I,O_2}	Inspired fraction of oxygen
E	Expired	V_E	Volume expired per minute
A	Alveolar	P_{A,O_2}	Alveolar partial pressure of O_2
a	arterial	P_aCO_2	Arterial partial pressure of CO_2

Upper case subscripts refer to air spaces.
Lower case subscripts refer to vascular locations.

How We Will Represent The Lung

Pressure and the Respiratory System

The Pressure Of A Gas

The pressure of a gas is the sum of the forces of the gas molecules striking the wall divided by the area of the wall.

How We Represent Pressure

Gauge Pressure

$P_{\text{air}} = 0$
 $P_{\text{H}_2O} = 5 \text{ cm H}_2O$
 $P_{\text{air}} = 0 \text{ cm H}_2O$

Used with mechanics, blood pressures

Absolute Pressure

$P_{\text{air}} = 0$
 $P_{\text{H}_2O} = 754 \text{ mm Hg}$
 $P_{\text{air}} = 755 \text{ mm Hg}$
 $P_{\text{air}} = 760 \text{ mm Hg}$

Used for gas pressure, fluid, blood, atmospheric

Partial Pressure

Partial Pressure: The pressure exerted by the kinetic energy of each separate gas in the mixture.

The partial pressure of each gas is proportional to its concentration (e.g., $PO_2 = P_a \times F_{I,O_2}$).

Dalton's Law: The total pressure of a mixture of gases equals the sum of the partial pressures of each gas.

We Are Concerned About The PO_2 At Many Points

Knowledge of these values helps determine why a patient has low blood oxygen levels (known as hypoxemia).

Barometric Pressure (P_B)

P_B is the total pressure exerted by the kinetic energy of all the molecules in our atmospheric mixture.

Barometric Pressure (P_B) Changes With Altitude

Barometric pressure is lower at higher altitudes because there are fewer air molecules in the atmosphere.

Gas Tensions In Ambient Air

$P_{\text{Gas}} = P_B \times F_{\text{Gas}}$

Variable	O_2	N_2
Fraction	0.21	0.79
Partial Pressure	150	600

$P_{\text{air}} = 760 \text{ mm Hg}$

$P_{\text{air}} = 641 \text{ mm Hg}$

Bozeman (Elev. 4,800 ft.)

Water Vapor

Atmospheric Gas → Upper Respiratory Tract

20°C → 37°C

Saturated with water vapor

Legend: \bullet Nitrogen, \circ Oxygen, \blacksquare Water

Partial Pressure Of Inspired Gases

Inspired partial pressure of a gas = Barometric pressure minus H_2O vapor pressure

Fraction of the inspired dry gas

$P_{I,Gas} = (P_B - 47) \times F_{I,Gas}$

I inspired
Mean major pressure is always 47 mm Hg at 37°C

Inspired Oxygen Tensions

$P_{I,O_2} = (P_B - 47) \times F_{I,O_2}$

Variable	Value
F_{I,O_2}	0.21
Ambient PO_2	150
Inspired PO_2	100

$P_{\text{air}} = 760 \text{ mm Hg}$

$P_{\text{air}} = 641 \text{ mm Hg}$

Bozeman (Elev. 4,800 ft.)

4-5

Small Group Leader: From 2006 until 2013, I served as a small group leader during which I supervised and taught the students as they worked through patient cases designed to increase their understanding of the course material. I relinquished this role in 2014 in order to institute better quality control in our small group sessions and have time to provide structured feedback to the other course instructors on their teaching. Numerical evaluations on a scale from 1 (poor) to 5 (exceptional) for my performance as group leader, with comparison to other faculty, are as follows:

Dimension	2007	2008	2009	2010	2011	2012	2013
Overall Effectiveness	4.9	4.6	5.0	5.0	5.0	4.8	5.0
Average Peer Scores	3.7	4.2	3.9	4.2	4.5	4.1	4.3

A sample of written comments for my work as group leader include the following:

2012: "Dr. Luks is awesome- I wish he taught my small group for every course. He makes sure to spend enough time answering any question and clearing up any topic we ask him to. You can tell he is a dedicated teacher and loves what he does." "I thoroughly appreciated and enjoyed Dr. Luks' style and effectiveness of teaching. He is truly gifted in this area and I am very thankful to have been in his small group for Respiratory. I honestly do not have any suggestions. Thank you so much for all of the time and effort you gave in teaching us." "When on the first day of small group Dr. Luks went around the room and demonstrated that he already knew every student's name with their face, it was instantaneously evident that he was genuinely invested in his students' success, and in their feeling a personable relationship with their instructor. This theme only continued, and developed more so, as the class went on."

2013: "Dr. Luks is a phenomenal small group teacher. His explanations and diagrams are very clear and he does a good job engaging students in active learning. He made the subjects easy to understand." "Dr. Luks is an amazing professor that has tremendous ability to explain things in a clear and concise manner. I looked forward to small group sessions!" "No suggestions for improvement. Dr. Luks is an excellent teacher who is truly engaged with his students and passionate about the material he is teaching. Stands out among the best of the best teachers we have had over the course of the past year and a half."

Complete copies of my complete evaluations are upon request.

- **Med 534 Wilderness Medicine Elective**

I am the course chair for this second year medical student elective that takes place on an annual basis in the spring quarter. In addition to my duties organizing the course, I deliver the following lectures, case-based modules or hands-on workshop each year:

- Introduction to Wilderness Medicine

- High Altitude Physiology and Medicine
- Diving Physiology and Medicine
- Waterborne Illness and Water Disinfection
- Splinting workshop
- Eye problems in the wilderness

Further information about the course and my leadership role, as well as evaluation information, is provided below under the Curriculum Development section of this portfolio.

- **Med 536 Introduction to Critical Care Medicine**

I am the co-course chair for this second year medical student elective that takes place on an annual basis in the winter quarter. In addition to my duties organizing the course and its related activities, I deliver the following lectures, case-based modules or hands-on workshop each year:

- Introduction to Critical Care Medicine
- Neurocritical Care
- Acute Respiratory Failure Case Conference
- Communicating About Prognosis workshop

I also lead several bedside teaching sessions for the students throughout the course. Further information about the course and my leadership role, as well as evaluation information, provided below under the Curriculum Development section of this portfolio.

- **Med 610 Clinical Respiratory Diseases Clerkship**

As part of this elective clerkship, students participate in weekly case-based teaching sessions led by attending physicians in my division. While serving as clerkship director between 2008 and 2013, I directed the development of new teaching materials for these sessions. During that time and since relinquishing the clerkship directorship, I have led, on average, 3-4 of these sessions per year, the typical allotment for clinician-educators in my division.

- **Med 620 Sub-internship in Critical Care Medicine**

I developed and continue to serve as clerkship director for this popular rotation. As part of this elective clerkship, I do weekly teaching sessions with the students rotating at the Harborview site during which I also include students working on other intensive care unit rotations in the hospital. During these sessions, I cover core topics in critical care medicine, such as mechanical ventilation, hemodynamics and sepsis management. I have not collected formal feedback but the informal feedback from the students has been very positive. Full details of my work as clerkship director are described below under the Curriculum Development section of this portfolio.

- **Med 665 Internal Medicine Clerkship Lecture Series**

As part of their third year core clerkship in Internal Medicine, all medical students participate in a weekly didactic lecture series. Since 2008, I have given a lecture entitled “A Grand Tour of Pulmonary Medicine” on a quarterly basis as part of this series. Evaluations are available for the 2011-2012 and 2012-2013 academic years. On a scale from 1 (poor) to 5(excellent), my scores were as follows:

Dimension	2011-2012	2012-2013
Organization / Clarity	4.6	4.7
Content	4.7	4.7
Overall Score	4.7	4.7

A representative sample of the written comments from my lectures have included the following:

2011-2012: “Dr. Luks is an amazing presenter. His lecture was great. It was very relevant to this clerkship and oriented in a manner that we can relate to at this point in our careers.” “Dr. Luks is outstanding. He successfully covered a ton of core material in a short amount of time.” “All around terrific. Because of the multiple breaks, I felt like I could pay better attention and by the end of it wanted more to do... Teaching was excellent as usual and very applicable and helpful.”

2012-2013: “Great learning!!! Dr. Luks is a wonderful teacher and always presents information in the most understandable, memorable way possible.” “I just wish I had time to listen to all of Dr. Luks’ presentations because he teaches in such a way that I pay attention the whole time and feel like I am actually learning important things in an easy way.” “Dr. Luks is the man! He is a fantastic educator and should give 75% of all other lecturers a how-to session on effective teaching.

- **Capstone Transition to Residency Course for 4th year Medical Students**

I deliver one to three lectures per year as part of this course including “How To Manage ICU Cross-cover Issues,” “Arterial Blood Gases” and “Chest Radiograph Interpretation.” I was unable to participate in the course in 2014 due to a scheduling conflict. Evaluations for the 2015 sessions were not available at the time this portfolio was assembled.

Annual ratings for “How to Manage ICU Cross-cover Issues” have been as follows: Students rated their level of agreement from 1(strongly disagree) to 5 (strongly agree).

Dimension	2011	2012	2013
Presentation was Clear and Organized	4.8	4.9	4.9
Content was useful and practical	4.9	4.9	4.9
The presenter was excellent	4.8	4.9	4.9

Annual ratings for “Arterial Blood Gases” have been as follows:

Dimension	2011	2012	2013
Presentation was Clear and Organized	4.9	4.9	4.9
Content was useful and practical	4.8	4.9	4.9
The presenter was excellent	4.8	4.9	4.9

Annual ratings for “Chest Radiograph Interpretation,” which I started delivering in 2012 have been as follows:

Dimension	2012	2013
Presentation was Clear and Organized	4.9	4.9
Content was useful and practical	4.9	4.9
The presenter was excellent	4.9	4.9

A representative sample of the written comments from my lectures includes the following:

2012: *“Dr. Luks is a great lecturer because he simultaneously gives a pragmatic approach to management while taking students back to their basic physiology to make a complex problem suddenly understandable.” “I have had the privilege of several lectures from Dr. Luks and this was as good as any. He is simply one of the best teachers I’ve ever met. I will be keeping this lecture on my USB drive for years to come.”*

2013: *“Keep up the incredibly good work, Dr. Luks! Thank you so much for being one of the best teachers I have ever encountered.” “Incredibly helpful information from an inspirational and engaging teacher.” “Very clear, organized. Amazing information for intern year.”*

- **Direct Supervision of Clinical Activities**

I supervise students who do rotations on my division’s clinical services at Harborview Medical Center and do a significant amount of direct teaching during these clinical activities.

Aggregate numerical ratings on a scale from 1 (very poor) to 6 (excellent) for my work supervising students between 2010 and 2014 are as follows (data are not available for individual years; 37 students are represented in this data)

Dimension	2010-2014
Knowledgeable and analytical	6.00
Enthusiastic and stimulating	5.97
Overall teaching effectiveness	6.00

Examples of written comments from the resident evaluations include the following:

“Andy Luks truly made this clerkship for me. He consistently prioritized my learning in his time management, protecting time for teaching on a daily basis. He challenged me in a way that set me up for success, that allowed me to flourish in what otherwise would have been a daunting setting. I feel fortunate to have been on when he was on service; my only advice to future student would be to ensure that they were able to do the same.”

“One of the best, if not the best, attending physician I've worked with. His enthusiasm for education and hands on teaching is inspiring and infectious. His knowledge is remarkable. Honestly, I can't think of any areas for improvement and I'd hope to become half the physician Dr. Luks is.”

“Dr. Luks is hands down one of the best teachers I've had in medical school. He is incredibly enthusiastic about teaching and creates a healthy and productive learning environment. I appreciated his focus on physiology, and his emphasis on evidence-based medicine. I always felt comfortable coming to Dr. Luks with questions, and he consistently took time to provide me feedback on my presentation and my write-ups. Additionally, Dr. Luks was great with patients and their families. The entire team was fortunate to have him as an attending!”

“Dr. Andy Luks is by far the best teacher I have encountered in all of medical school. In fact, most of the reason I signed up for this rotation was to work with him. He made a consistent effort to sit down and do teaching sessions (in addition to the teaching he did with each patient) and this made such a huge difference in the rotation. He even made time for teaching when he wasn't the attending on the Pulmonary Consults service, which truly shows how he goes above and beyond to help us get the most out of the rotation.”

- **Med 505 Medical Student Preceptorship**

I have supervised a total of 13 medical students as part Med 505, which places students in preceptorships with practicing clinicians. The list of students is provided under Section 7 of this teaching portfolio (Mentoring). Participating students spend a total of 8 sessions with me per quarter during which they receive one-on-one teaching from me and join me for ICU work rounds with my teams. The average numerical ratings on a scale from 1 (very poor) to 6 (excellent) of the 13 students' experience with me during their preceptorships are as follows:

Dimension	Average Rating
Clarity of expectations for my participation	5.85
Increasing my knowledge of the specialty	5.92
Meeting my own objectives for the preceptorship	5.85
Interactions with my preceptor	6.00

A representative sample of student comments regarding their work with me during their preceptorship includes the following:

“Dr. Luks was perhaps the best preceptor/teacher I’ve had to date. He is incredibly organized and prepares in advance for what he will teach. The bedside interactions and pre-rounds teaching were both a great learning experience. He also did a great job asking questions and making the learning experience active.”

“...Dr. Luks is the best preceptor I’ve ever had. He was incredibly attentive to my learning and took hours of extra time to teach me one-on-one. He introduced me and made me feel like a part of the medical team, evening pimping (kindly!) on rounds. He seemed to know just where my learning level was and taught me right there, focusing on the most important information for me about each patient. He is kind, personable, flexible and open to questions. I really enjoyed working with him. It could not have been a better experience.”

“Time spent with Dr. Luks... before rounds was some of the most valuable teaching/learning that I have ever participated in. He is simply an amazing teacher and in speaking with other students who he teaches, this seems to be a consensus. He has a great sense of humor and he challenges students. His emphasis on thinking and on physiology will serve students well. Also, he possesses the rare quality of understanding that preceptees need to be babysat at times... He did an incredible job of making sure I had a great experience all the time (even when we were just observing an admission to the ED, for example. He is also fantastic about taking care of coordinating, always gets back to emails right away and sends debriefing info emails after precepting. I think Dr. Luks is one of the best teachers I have ever been able to learn from.”

The teaching by Dr. Luks was exceptional. He spent much of his time teaching one-on-one while also attending to his patients. I learned an enormous amount from his team and am excited to pursue critical care... Dr. Luks provided a safe but challenging learning environment.”

“Dr. Luks is the most amazing teacher I’ve had in medical school. He makes complex concepts easy to understand and pushes students to learn and grow in a completely supportive learning environment.”

Resident Education

I have the following roles in resident education:

- **Internal Medicine Residency Lunch Conference Lectures:** Since 2005, I have delivered lectures as part of the Internal Medicine Residency training program educational series. Topics I have covered during these lectures include:
 - Asthma and COPD
 - Arterial Blood Gases
 - Diagnosis and Management of COPD
 - Diving Physiology and Medicine
 - Environmental Medicine
 - High Physiology and Medicine
 - How to Troubleshoot Problems With Mechanical Ventilation
 - Liberation From Mechanical Ventilation
 - Managing Acute Respiratory Failure
 - Managing Hypoxemic Respiratory Failure
 - Pulmonary and Critical Care Medicine in the Pregnant Patient
 - Pulmonary Function Tests and ABGs
 - Pulmonary Hypertension
 - Pulmonary Vascular Disease
 - Respiratory Physiology in the ICU
 - Sepsis: Recognition and Management
 - The Basics of Mechanical Ventilation
 - The Pulmonary Effects of Illicit Drugs
 - The Work-up of Pleural Effusions

The number of lunch conference lectures I have delivered each year since joining the faculty is as follows:

2008	2009	2010	2011	2012	2013	2014
7	5	4	3	3	3	4

Examples of the PowerPoint slide decks from two lectures I give to the residents are provided below (see the following page). The slides in these images represent only a portion of the slides used in each lecture.

Lecture on Pulmonary Vascular Disease

Pulmonary Vascular Diseases

Internal Medicine Resident Teaching Conference

Andrew M. Luks, MD
Division of Pulmonary and Critical Care Medicine
University of Washington

This Talk Will Employ Audience Response

1 Go to www.rwpoll.com and enter the following number:
Lukspoll

2 Press "Join Session"

3 Press "Continue" (do not sign in)

Pulmonary Vascular Diseases

DISCLOSURE STATEMENT

Dr. Luks has no commercial, non-commercial, or institutional financial interests or personal financial relationships to disclose regarding the material presented in this lecture but strongly believes that the pulmonary circulation is very cool.

The Plan For Today's Lecture

Topic Coverage
Brief review of pulmonary circulation physiology
Review of three main forms of pulmonary vascular disease

For Each Type of Disease
When to consider the diagnosis
Appropriate work-up
Management priorities

Key Aspects of the Pulmonary Circulation

The Capillary Walls Are Extremely Thin

The thin walls are great for gas exchange but require that intravascular pressures within the capillary network remain low

Pressure Remains Low As Cardiac Output Increases

The Key To Keeping PA Pressure From Rising

Baseline: Anterior, Capillary, Venous. Increased blood flow. Recruited and Distended.

Hypoxic Pulmonary Vasoconstriction (HPV)

Low alveolar PO₂ triggers localized vasoconstriction

The Pulmonary Circulation Defends Against Problems

The pulmonary capillary network serves as a filter catching small clots and bits of infected material

A Case

A 42 year-old G2P2 woman presents with several months of increasing dyspnea on exertion. She denies fever, weight loss, cough or hemoptysis, has no other medical history and takes no medications

Pulmonary Function Tests

Test	% Predicted
FEV ₁	84
FVC	83
FEV ₁ / FVC	N/A
TLC	98
DLCO (corr)	43

Your Question

What is the most appropriate diagnostic test to order at this time?

1. Cardiopulmonary exercise test
2. CT pulmonary angiogram
3. Echocardiogram
4. Electrocardiogram
5. Right heart catheterization

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Pulmonary Hypertension

Why PA Pressure Rises: A Physiologic Approach

$V = IR$ (Ohm's Law)

$\Delta P = Q \times R$

Change in Pressure, Cardiac Output, Resistance

Physiology and Diagnosis

$\Delta P = Q \times R$

$P_{PA} - P_{LA} = PBF \times PVR$

$P_{PA} = (PBF \times PVR) + P_{LA}$

1, 2, 3

The WHO Classification of Causes

Group	Basic Problem	Disease Examples
1	Disease in small arteries	Idiopathic PAH, HIV, Collagen vascular disease, anorexigens
2	Left heart disease	Left heart failure, valvular heart disease
3	Lung disease, Alveolar hypoxia	COPD, IPF, Obesity Hypoventilation
4	Chronic thromboembolic disease, schistosomiasis	Chronic thromboembolic disease, schistosomiasis
5	Unclear multifactorial	Sarcoidosis, Rasmussen's mediastinitis

When To Suspect Pulmonary Hypertension

Otherwise Healthy Person*
Isolated dyspnea on exertion (stand review of symptoms)
Chest pain or syncope with exertion in person without risk for CAD

Underlying Disease
New onset of dyspnea or uptick in preexisting level of dyspnea
Can be hard to tease this out in certain disease processes

* Particularly a young middle aged woman

Suggestive Findings: Electrocardiography

Prominent P-wave in Lead II
R/S > 1 in Lead V1
Right Axis Deviation
RV Strain
Right Bundle Branch Block

Suggestive Findings: Pulmonary Function Testing

Test	Actual	Predicted	% Predicted
FEV ₁	1.95	2.31	84
FVC	2.38	2.87	83
FEV ₁ / FVC	0.82	0.81	N/A
TLC	4.26	4.36	98
DLCO (corr)	9.96	23.25	43

An isolated decrease in the DLCO is highly suggestive of a pulmonary vascular process

Suggestive Findings: Chest Imaging

As: Aorta, PA: Pulmonary Artery

Lecture on Pulmonary Function Test and Arterial Blood Gas Interpretation

Pulmonary Function Test and Arterial Blood Gas Interpretation

Internal Medicine Residency Lecture Series
August 11, 2014

Andrew Luks, MD
Associate Professor
University of Washington
Division of Pulmonary and Critical Care Medicine

Andrew M. Luks, MD
Pulmonary Function Test and Arterial Blood Gas Interpretation

DISCLOSURE STATEMENT

Dr. Luks has no commercial, non-commercial, or institutional financial interests or personal financial relationships to disclose regarding the material presented in this lecture.

A General Approach To Pulmonary Function Tests

ABGs: A General Approach

Case 1

Case 1

A 64 year-old man presents to clinic for evaluation of increasing dyspnea on exertion and a dry cough over a 6-month period. He has not had fevers, chills, weight loss or hemoptysis. He is a life-long non-smoker who worked in the fishing industry for many years before opening his own marine supply store 10 years ago. You obtain a full set of Pulmonary Function Tests and an arterial blood gas.

Case 1 Data

PFTs From Current Clinic Visit

PFT Parameter	Predicted Value	Measured Value	% Predicted
FEV ₁ (L)	2.10	1.97	92
FVC (L)	2.87	2.25	78
FEV ₁ /FVC	0.76	0.87	N/A
TLC (L)	5.05	3.92	0.77
RV (L)	2.20	1.05	74
DLCO (mmHg)	23.08	14.60	0.63

pH 7.45 | P_aO₂ 30 | P_aCO₂ 54 | HCO₃ 20 | BE -3.5

Your Case 1 Tasks

- Interpret the pulmonary function tests
- Interpret the arterial blood gas
- What is the appropriate next diagnostic step?
 - Cardiopulmonary exercise test
 - CT pulmonary angiogram
 - Echocardiogram
 - High resolution chest CT
 - Maximum inspiratory and expiratory pressures

The Normal FEV₁/FVC Ratio

Global Initiative for Obstructive Lung Disease (GOLD)

LLN = 0.7

UW Medicine Approach (incorporates ATS/ERS approach)

Man: LLN = Predicted ratio - .08
Woman: LLN = Predicted ratio - .09

LLN: Lower limit of normal

PFT Review

Follow this up with chest imaging

Acid-Base Status Review

Case 2

Case 2

A 59 year-old man presents to the emergency department with two days of increasing dyspnea and productive cough. He was seen in the outpatient clinic several months ago for evaluation of chronic dyspnea, at which time he had PFTs. He does not recall the results but you are able to access them in the Emergency Department and review these as well as an arterial blood gas drawn while breathing ambient air.

Case 2 Data

PFTs From Prior Clinic Visit

PFT Parameter	Predicted Value	Measured Value	% Predicted
FEV ₁ (L)	2.53	1.13	29
FVC (L)	4.37	1.45	30
FEV ₁ /FVC	0.81	0.75	N/A
SVC (L)	4.45	3.95	68
TLC (L)	6.65	7.80	120
RV (L)	2.29	6.30	280
DLCO (mmHg)	32.49	17.81	52

pH 7.23 | P_aO₂ 75 | P_aCO₂ 44 | HCO₃ 30 | BE 4.3

Your Case 2 Tasks

- Does this patient have obstructive lung disease?
- What is the cause of the patient's hypoxemia?
 - Diffusion impairment
 - Hyperventilation
 - Hypoventilation
 - Low V_A/Q
 - Hypoventilation and low V_A/Q

PFT Review

The FEV₁/SVC can be substituted for the FEV₁/FVC

Why Was The Vital Capacity So Low?

This can be seen in very bad airflow obstruction and is often reflected in a high RV/TLC ratio

Acid-Base Status Review

Primary Respiratory Acidoses

Type	P _a CO ₂	pH	Base Excess
Acute	Increased	Far below 7.35	-2 to 2
Chronic	Increased	Near or above 7.35	> 2
Acute on Chronic	Increased	Far below 7.35	> 2

Base excess > 2 indicates a metabolic alkalosis
Base excess < -2 (i.e. base deficit) indicates a metabolic acidosis

Case 3

A complete set of PowerPoint slide decks from my resident lectures is available upon request.

Peer reviews of my lectures to the residents and other trainees are contained in the complete Promotions Packet.

- **Chairman's Rounds**

I have delivered the following lectures at weekly Chairman's Rounds or Chief of Medicine Rounds sessions:

- VA Medical Center 11/05: Chronic Eosinophilic Pneumonia
- VA Medical Center 5/06: The Work-up of Pleural Effusions
- VA Medical Center 9/06: Empyema and Thoracic S. Milleri Infections
- VA Medical Center 12/06: Chylothoraces
- University of Washington Medical Center: 1/08: Pregnancy and Pulmonary Hypertension
- Harborview Medical Center 10/08: Necrotizing Pneumonia
- Harborview Medical Center 2/09: Massive Pulmonary Embolism
- Harborview Medical Center 9/09: Cryptococcus in the Immunocompetent
- University of Washington Medical Center 1/10: Pulmonary AVMs in Hereditary Hemorrhagic Telangiectasia
- Harborview Medical Center 5/10: Diving Accidents
- Harborview Medical Center 9/10: Massive Hemoptysis
- Harborview Medical Center 1/11: Outpatient COPD Management
- Harborview Medical Center 2/11: Diving Complications
- Harborview Medical Center 8/12: Complications of Diving

- **Medicine Intern Teaching Conference**

I give an annual lecture entitled "How To Read a Chest X-ray in the Middle of the Night" as part of the annual series of lectures delivered to the interns at the start of their training. The numerical scores on a scale from 0 (poor) to 5 (excellent) from the evaluations of my lectures for the past three years are summarized below (Data are not available for 2011 and have not been received for the 2015 session):

Dimension	2006	2007	2008	2009	2010	2012	2013	2014
Content	5.0	5.0	4.9	4.9	5.0	4.9	5.0	4.9
Interactiveness	4.8	5.0	4.8	4.9	5.0	5.0	5.0	4.9
Overall Quality	4.9	5.0	5.0	4.9	5.0	4.9	5.0	4.9
# of Evaluators	20	16	8	16	10	48	37	65

Complete evaluations for these lectures are available upon request.

- **Clinician Educator Track Curriculum**

As part of the dedicated curriculum for Internal Medicine residents on the program's clinician educator track, I have given a lecture entitled "How to Give a Large Group Lecture" on an annual basis since 2013.

- **Chief Resident Development Series**

Beginning in 2014, I have given an annual lecture to the Internal Medicine Residency Program's Chief Residents entitled "Practical Rules of Thumb for Large Group Lectures Using PowerPoint."

- **Other Residency Program Lectures**

I have given lectures to the following other residency programs in the School of Medicine:

- Emergency Medicine Residency: High Altitude Medicine and Physiology (4/14)
- General Surgery Residency (Trauma Conference): Pregnancy and Critical Care Medicine (4/11); Monitoring Devices in the ICU (3/13); The Why, When, What and How of Nutrition in the ICU (10/14)
- Neurology Residency: How to Give a Large Group Lecture (3/13)
- Nuclear Medicine Residency: Pulmonary Embolism (6/10 and 3/11)
- Pediatrics Residency Wilderness Medicine Class: High Altitude Medicine and Physiology (6/08, 6/09, 5/11, 6/13, 7/13, 7/14)

- **Morning Report**

I attend Morning Report about one to four times per month on average when I am not on clinical service. The amount of teaching I do as part of this activity varies depending on the case being discussed, the chief resident's comfort with the material and other factors but the overall goal of my presence is to be available to fill in gaps not covered by the residents and Chief Resident. Formal evaluations are not available for this teaching activity.

- **Direct Supervision of Clinical Activities**

I supervise internal medicine residents participating in rotations on the Medical ICU and Pulmonary Consultation services as well as anesthesiology, emergency medicine and general surgery residents doing rotations on the neuro- and trauma-surgical ICU services at Harborview Medical Center. As part of this work, I do a significant amount of direct teaching and have established a reputation for devoting a lot of time towards teaching on rounds.

Numerical ratings on a scale from 1 (very poor) to 6 (excellent) for my work supervising residents are as follows:

Dimension	2009-2011	2011-2013	2013-2015
Knowledgeable and analytical	6.00	5.90	5.94
Enthusiastic and stimulating	5.96	5.83	5.82
Overall teaching effectiveness	6.00	5.97	5.90

2009-2011 data are based on 24 responses. 2011-2013 data are based on 29 responses; 2013-2015 data are based on 49 responses

Examples of written comments from the resident evaluations include the following:

"I appreciated the structure that Dr. Luks brought to our learning and to rounds. His morning talks were extremely pertinent to our ICU experience and also easy to follow. I appreciated the visuals that helped support our learning. I also appreciated that he gave us clear expectations in terms of what he wanted on rounds. It helped me hone my learning by focusing on the pertinent information and painting a clear, cohesive picture of my patients, because I knew what was expected of me. Finally, I appreciated that Dr. Luks took the time to get to know me as a person. He always took time to ask me how I was doing and to ask me about my interests. On an intense, busy rotation, it is nice to know that people care about you as a person."

"One of the best teaching faculty at the UW. He helps us be precise in our language so that we communicate on rounds and in our notes clearly. I like that he holds us to the highest standard possible, since it is only then that I felt I was pushed to work at my peak. Excellent morning lectures that help clarify complex topics (and are taught so well and clearly that they can be used by the senior resident to teach others at later times)."

"Dr. Luks was truly the epitome of clinician-educator excellence throughout his time as the MICU attending.... He created a comfortable learning environment and used time appropriately and effectively both during attending rounds and at the bedside to teach key and pertinent critical care concepts. He employed the Socratic method in manner that was not alienating. He was approachable and easy to work with...He struck an excellent balance between providing guidance and allowing for autonomy in patient management decision making process. He had excellent manner with patients, demonstrating genuine empathy and compassion."

"His teaching is beyond excellent, with great teaching points on rounds that do not bog the team down, attending rounds drawn from our interesting cases, and daily emails sent to the team with reviews or primary literature pertaining to previous discussions. He can be a stickler for precise language and completeness in presentations, and although I was hesitant at first, I think this was good and promoted a rigorous and not overly-anal approach to rounds and patient care. He is extremely well read, and clearly puts a large amount of effort into teaching, and it shows."

"Enthusiastic teacher, appreciate how much importance he placed on teaching despite the busy schedule of the ICU. Methods for teaching were very effective and engaging, using the board and e-mailing short articles/summaries. Helped to include evidence-based medicine into clinical practice that was memorable instead of rote regurgitation of stats. Inspiring presence, makes everyone more positive overall."

Fellow Education

I am involved in the following direct teaching activities with fellows in the School of Medicine:

- **Critical Care Medicine Fellowship, Program Director.**
Since 2012, I have served as the program director for the Critical Care Medicine training program, the smaller of the two fellowship programs run by my division. More details about this teaching activity can be found in Section 7 (Mentoring Activities) and Section 8 (Educational Administration and Leadership)
- **Division of Pulmonary and Critical Care Medicine Lectures:** My division has a weekly educational conference that follows Seattle Area Chest Grand Rounds that serves as one of our core teaching series for the fellows training in our program. I have delivered the following lectures are part of this conference series:
 - An Educational Romp Through Ladakh 11/07
 - Diving Physiology and Medicine 4/10, 8/13
 - Hemodynamic Monitoring in the ICU 2/11, 8/11, 11/12
 - High Altitude Physiology 10/10
 - Parasitic Lung Diseases 6/11
 - Physiology at Work in the ICU 7/13, 7/14, 7/15
 - Pregnancy and Pulmonary and Critical Care Medicine 12/10, 1/12, 10/14
 - Pulmonary Patients at High Altitude 5/09
 - The Basics of the Pulmonary Artery Catheter 5/12
 - The Why, When, What and How of Nutrition in the ICU 6/14

Peer review information for my lectures is contained in my complete Promotions Packet.

- **Direct Supervision of Clinical Activities**
I supervise Pulmonary and Critical Care Medicine, Anesthesia Critical Care and Trauma Critical Care fellows on four separate services at Harborview Medical Center including the medical ICU, the pulmonary consultation service, the neurocritical care team and the trauma surgical ICU. As part of this work, I do a significant amount of direct teaching. By virtue of the fact that I do a significant amount of attending time each year, I have a significant amount of interaction with all of the trainees.

Numerical ratings on a scale from 1 (very poor) to 6 (excellent) for my work supervising residents are as follows:

Dimension	2009-2011	2011-2013	2013-2015
Knowledgeable and analytical	Data not available	6.00	5.93
Enthusiastic and stimulating	Data not available	6.00	5.79
Overall teaching effectiveness	Data not available	6.00	5.93

The 2011-2013 data are based on only two responses. 2013-15 data reflects 14 responses

Examples of written comments from the fellow evaluations include the following:

“Andy is clearly an outstanding clinician educator (one of the best at our institution) and it is always a pleasure to be on service with him. One of his strengths is his ability to teach to all levels, but I was most appreciative of the time he took with me to improve my own skills as an educator. Not only did he cover topics at a level appropriate for a fellow, but also spent time teaching me how to improve my teaching strategies for when I am working with medical students and residents.”

“Andy is truly a gifted educator and clinician. He models excellent patient care and family interactions. He also dedicates enormous effort to ensuring that the ICU is an environment filled with learning. He presents teaching in a clear, concise way, and includes all members of the team.”

“Outstanding teacher, both on rounds, at the bedside and during morning didactic sessions. Extremely available to me and provided the appropriate level of support while still allowing me to gain confidence taking on a new role of leadership and instructor.”

“I feel lucky to have had the opportunity to work with Andy. He's an outstanding educator and I was impressed by his commitment to education at all times. I learned from him how to squeeze in teaching moments, even on chronic patients without active problems. This was also the first opportunity I've had to see Andy interact with patients and was impressed with his bedside manner. Overall, a great role model for fellows in clinical care, bedside manner, and teaching.”

“Absolute master at modeling how to teach pulmonary medicine, especially to our MS3s. Also appreciated fellow level teaching/feedback. Very good mix of efficiency and thoroughness, especially as clinic preceptor. Took a lot away from our week together.”

“Dr. Luks is a wonderful teacher. He is clearly interested in making everybody he works with a better physician, however being constantly evaluated can be difficult at times. His teaching style is top notch and his ability to interact and connect with patients is a standard that everybody should strive for.”

Allied Health Professional Education

I have delivered lectures to the following Allied Health Professional groups:

- **Airlift Northwest:** I served as a discussant for case-based learning sessions for the Airlift Nurses on 3 occasions as part of their competency training in the fall of 2010.
- **Medic One Paramedic Training Program:** On an annual basis since 2005, I have delivered lectures as part of the paramedic student's core lecture series. I served as director of the lecture series between 2008 and 2012 when I relinquished the

organizational duties to a colleague. I continue to give two lectures a year as part of this lecture series.

- **NCLIN 560 Seminar in Primary Care:** I delivered a lecture on Pulmonary Function Test Interpretation to the nurse practitioner students in 2013 and 2014.
- **Nursing 533** Evidence-Based Management of Common Health Concerns 8/10 and 5/11: Outpatient Management of COPD

Grand Rounds Lectures

I have given the following Grand Rounds lectures:

- Virginia Mason Medical Center Department of Medicine 1/09: Advising the Traveler to High Altitude
- University of Washington Division of Cardiology 2/09: Adult Congenital Heart Disease Patients at High Altitude
- Evergreen Hospital 3/10: Advising the Traveler to High Altitude
- Boise Veterans Affairs Medical Center 3/14: Advising the Traveler to High Altitude

Evaluative information is only available for the talk given at the Boise VA Medical Center. The talk received a 4.9 rating on a scale from 1 (poor) to 5 (excellent). The limited number of written comments included: *“Incredible talk, great information;” “Great presentation, interesting topic;” “Great talk, practical with great physiology review.”*

Community Education

One of my primary clinical interests is high altitude medicine and physiology. Since 2004, I have given lectures to various groups in the greater Seattle area as part of an effort to educate climbers and other people traveling to high altitude about how to recognize, prevent and treat acute altitude illness. I have delivered the lecture, titled Safe Travel at High Altitudes (the exact title and content will vary a little based on the group to whom I am speaking) over 50 times to the following groups or at the following locations:

- Recreational Equipment Incorporated (Seattle and Bellingham stores)
- Wide World Books and Maps in Wallingford
- Mountain Equipment Coop (Vancouver store)
- The Seattle Mountaineers
- The Washington Alpine Club
- BoeAlps Climbing Club
- Island Fitness Rainier Preparation Class

Evaluation information is not available for these lectures.

Curriculum Development

Med 536 Introduction to Critical Care Medicine

Background: When I started as an attending physician, medical students in the University of Washington School of Medicine received little training in critical care medicine. The topic was covered infrequently in the core basic sciences curriculum and students had somewhat limited opportunities to do intensive care unit (ICU) rotations in their fourth year of school. At the same time, there has been a growing need for students to develop skills in this area. With the growing age of the general population and increasing levels of medical complexity, the need for doctors with critical care training has continued to increase. In addition, students who choose to go into primary care and practice in a rural area need to know these skills as they will serve as the first line of treatment for many critically ill patients before they are transferred into larger facilities.

What Was Done: Working together with Mary King in the Department of Pediatrics, I created an elective course for second year medical students called “Introduction to Critical Care Medicine” which exposes the students to core critical care topics such as shock and acute respiratory failure and helps reinforce skills such as arterial blood gas analysis and chest radiograph interpretation. Since that time, Trish Kritek, a member of my division, has joined the leadership team and we continue to provide an integrated curriculum with a large amount of clinical exposure through the following learning modalities:

- Didactic lectures
- Hands-on workshops
- Group Take-Home Assignment
- Bedside teaching sessions with ICU attending physicians
- Time spent shadowing residents on call in the ICU
- Attendance at morning ICU rounds.

Access to the course website is available on request (it is a password protected Canvas site that is usually open only to enrolled students)

Outcomes: The course has been offered on an annual basis since 2009. Since starting the course with 20 students in 2009, we now enroll 36 students per year. We have capped enrollment at that level as we cannot facilitate all of the hands-on and in-person learning experiences with a larger group. Demand for the course among students has remained high and we have not been able to accommodate all of the students on the waiting list each year.

Numerical evaluations for the course have been as follows (data for the 2015 offering of the course are not available as of this time):

Question	2009	2010	2011	2012	2013	2014	2015
Please rate the overall quality of the course (1 – Poor; 5 – Excellent)	4.9	5.0	5.0	5.0	4.9	5.0	5.0
Compared to other elective courses you have had, this course was: (1 – much worse; 5 – Much better)	4.4	4.8	4.8	4.8	4.8	4.9	4.9

A representative sample of free response comments from the students includes:

2013

"In the beginning I was on the fence about signing up for this course due to time commitments. Needless to say, I'm glad I took it because it was one of the best classes I've ever taken. I feel like this class tied up all organ system classes taken at that point and gave us some great experiences in the wards."

"This is the best class I've had in all of med school. What an amazing way to review some renal, CV, and respiratory physiology and get to see actual patients as well. I wish I could take this class all year long!"

"Such a great course! I wish that all second year students had the opportunity to take this course because not only is it an excellent review of key material, but it is exciting and engaging as well."

2014

"This was one of the best courses that I have taken. I learned a ton through the hands on clinical education mixed with the in class presentations. All of the instructors are excellent! I was very impressed by this course. The lectures were well done and at a level that was appropriate for the audience. The scheduling for the out of classroom time was so well done that it made for smooth transitions and no loss of learning time. The amount of opportunity outside the classroom was very impressive. The teaching inside and outside the classroom was top notch."

"It was all that I was looking for in a class to introduce me to the field of critical care. It was engaging, informative without a lot of stress. I thoroughly enjoyed coming each week. One of the best courses I have been in. It really tied everything we were learning throughout 2nd year together, made us apply our knowledge, and then allowed us to see it on the wards and put the final pieces together!"

"This is the best class thus far. I wish every systems class had a class like this afterward where you could apply the knowledge that you learned in the systems class."

2015

"This has been my favorite class of med school, hands-down. It integrates many of the systems course material (especially including CV, renal, and pulm) AND was interesting AND best of all was clinical. I remember SO much more of the physiology and/or meds in the context of actual patients. Obviously this class isn't scalable across our entire

cohort of 250 students, which is too bad, because it's the most amazing learning experience I've had yet."

"This course really tied together a lot of what we had learned throughout medical school, which was inspiring and exciting!"

"This course really tied together a lot of what we had learned throughout medical school, which was inspiring and exciting!"

"I am so glad I took this course- I learned so much and was reminded of really important physiology in the context of complicated medical care. The instructors' enthusiasm was palpable, and of course it was incredibly organized! Thank you so much for a wonderful course- I wish I could take it again!"

Pictures from the annual Airway Management Workshops can be found at the following URLs:

2013:

<https://picasaweb.google.com/115376496044199664093/AirwayManagementWorkshop2013>

2014:

<https://picasaweb.google.com/115376496044199664093/AirwayManagementWorkshop2014>

2015:

<https://picasaweb.google.com/115376496044199664093/AirwayManagementWorkshop2015>

Education Scholarship Related To This Course: There have been several completed projects and one planned project regarding this elective course:

- **Abstract in Medical Education:** A peer-reviewed Really Good Stuff abstract was published in Medical Education describing our curriculum. The citation is as follows: Luks AM, King M. Early Introduction to Critical Care Medicine. Med Educ 2011. 45(5): 515.
- **MedEdPortal:** The curriculum has been peer reviewed and accepted for publication by MedEdPortal. The NLM listing for the publication is as follows: **Luks AM**, King M, Early Introduction to Critical Care Medicine: An Elective Course for Second Year Medical Students .MedEdPORTAL; 2011. Available from: <http://www.mededportal.org/publication/8240>
- **Student Choices of Medical Specialty:** Working with the Department of Medical Education and Biomedical Informatics, Dr. King and I are tracking residency preferences and actual choices of training specialties among students who take the course to see if there has been an increase in the number of

students choosing a career in critical care since the inception of the course. We are waiting for enough of the students who have taken the class to make it through their residency training to have enough data for this analysis.

Med 534 Wilderness Medicine

Background: Prior to 2008, wilderness medicine education was delivered in a haphazard fashion in the School of Medicine. Elective courses were organized by the students themselves and only took place during years in which one or more students were willing to devote the time and energy to running the class under the nominal leadership of a faculty member. In 2008, I worked with David Townes from the Division of Emergency Medicine to create a more permanent course structure whereby the course is offered on an annual basis in the spring quarter.

What Was Done: In 2008, Dr. Townes and myself served as co-course chairs. Since 2009, I have organized and run the course myself. The elective currently consists of seven weekly sessions that involve a mixture of didactics, case discussions and hands-on training sessions during which we cover the following topics:

- Introduction to Wilderness Medicine (didactic)
- Wilderness Medicine Case Conference (interactive case discussion)
- Bites and Envenomations (didactic)
- Diving and Submersion Injuries (case-based small group session)
- Orthopedic Injuries in the Wilderness (didactic)
- Relocating Dislocated Joints (hands-on workshop)
- Eye Problems in the Wilderness (case-based small group session)
- Splinting Workshop (hands-on workshop)
- Hypo-and Hyperthermia (didactic)
- Patient Assessment (hands-on workshop)
- High Altitude Medicine (case-based small group session)
- Decision-making in the Wilderness (case-based small group session)

The class also includes optional Weekly Wilderness Medicine Puzzles and all students complete a group project at the end of the course in which they construct an evacuation litter based on a given wilderness medicine scenario.

Access to the course website is available on request (it is a password protected Canvas site that is usually open only to enrolled students).

Outcomes: The course has been offered on an annual basis since 2008. For the first three years, enrollment was generally around 18-20 students but since 2011, I have had 30-40 students in the course per year. Numerical evaluations for the course have been as follows:

Question	2008	2009	2010	2011	2012	2013	2014	2015
Please rate the overall quality of the course (1 – Poor; 5 – Excellent)	4.5	4.4	5.0	4.4	4.9	4.8	4.9	4.8
Compared to other elective courses, this course was: (1 – much worse; 5 – Much better)	4.2	3.8	4.5	4.2	4.6	4.3	4.7	4.7

A representative sample of free response comments from the students includes:

2013

"I really enjoyed the course. It was engaging and relevant information and activities that made me feel like I would have some ideas of how to handle an incident in the field and also made me very aware of how I can take steps to avoid making mistakes that could cause an accident for myself."

"Awesome course. Anyone interested in wilderness medicine or just wilderness exploration itself should take the class. Not only is it good knowledge to have, but the exposure to different aspects and thought processes for various scenarios is great practice for future adventures."

"I had some great electives at UWSOM so it's hard to beat them, but this was definitely one of the highlights."

2014

Exceptional class! This is the 6th elective that I've taken in the last two years and is, hands down, at the top of the list (a close second is Dr. Pottinger's Tropical Medicine). Great job in taking a wide array of subjects and incorporating them into a rather time-constrained schedule.

"The amount of active learning through skill building and cases was phenomenal. The topics were interesting and there was no time where I felt I'd rather be in another place."

"Andy is a great course chair - he makes great efforts to ensure that the class is well organized and he takes the time to know all his students. This is effective in many ways. First, it personalizes the class, and second, we know that we are held accountable. The class takes into account other classes and second year timing with the boards."

2015

"This class was a wonderful complement to many of our other more rigid organ-system courses. I enjoyed tying in infectious disease, respiratory, mental health, renal etc into cases outside the hospital. It was a refreshing break and a creative way to stretch the mind."

"Fantastic course, one of the highlights of the first two years of medical school. The class was both great to reinforce concepts from various classes, as well as to learn new concepts."

"Dr. Luks is hands down one of the most knowledgeable and most effective teachers I've had in medical school. His passion for the topic is obvious, and infectious."

"Not only because of the content, but also because of the interactivenss of the course, this was both enjoyable and I learned so much more. Andy Luks is an incredible teacher, and knows how to keep a class interested and excited!"

Education Scholarship Related To This Course: No scholarly publications have been created from this course.

Faculty Development Workshop – Demystifying the Educator’s Portfolio

Background: For many years in the School of Medicine, the teaching portfolio was expected to be a part of the promotions packet for any individual with teaching responsibilities. At the same time, faculty were receiving little guidance from their departments and the School regarding how to develop a portfolio and the means by which it would be evaluated and incorporated into the promotions process.

What Was Done: The 2006-2007 Teaching Scholars cohort, of whom I was a member, conducted a group project in which we examined the medical education literature on portfolios, communicated with people at outside institutions and developed a template for the teaching portfolio and a more detailed set of instructions about how to create an effective document. Our work was presented to Dean Ramsey and the Medical School Executive Committee. To further disseminate this knowledge, we then created a faculty development workshop, entitled “Demystifying the Teaching Portfolio,” which was offered to School of Medicine faculty in 2008, 2010 and 2012. I have also given shorter lectures on this topic at the Faculty Development Workshops as well as to faculty within various sections and departments including Hospital Medicine, Emergency Medicine and Obstetrics and Gynecology.

Results: Numerical evaluations for the workshop have been as follows (on a scale of 0 [low] to 5 [exceptional]):

Dimension	2008	2010	2012
Rating for the workshop as a whole	4.7	4.6	4.8
Clarity of content	4.7	4.4	4.6
Organization	4.7	4.6	4.6
The appropriateness, relevance and integration of information to workshop content:	4.7	4.5	4.8
The amount I learned in this workshop was:	4.6	4.3	4.4

The evaluations for the lectures I delivered as part of the workshop have been as follows (on a scale of 0 [low] to 5 [exceptional]):

Dimension	2008	2010	2012
Clarity and organization of presentation	4.6	4.6	4.8
Usefulness of presentation in understanding workshop content	4.5	4.6	4.8
Skill in use of instructional resources	4.3	4.5	4.6
Enthusiasm and stimulation of participant interest	4.5	4.6	4.7
Overall teaching effectiveness	4.5	4.6	4.8

Education Scholarship Related To This Project: A peer-reviewed Really Good Stuff abstract was published in Medical Education describing our project and the workshop. The citation for this publication is: Luks AM, Yukawa M, Emery H. Disseminating Best Practices for the Educator's Portfolio. Med Educ. 2009. 43(5): 497-498.

Med 610 Fourth Year Clerkship in Pulmonary and Critical Care Medicine

Background: The Division of Pulmonary and Critical Care Medicine has sponsored a clerkship for fourth year medical students for many years. Weekly didactic sessions were held for the students taking part in the clerkship but for a long time before I became clerkship director, the presentation of material was relatively unstructured with a lot of variability between attending physicians who led these sessions. In addition, relatively limited educational materials were provided to clerkship students outside of these weekly didactic sessions.

What Was Done: I assumed directorship of the clerkship in 2008. Working together with colleagues within my division, I revised our weekly educational series, creating a series of cases and supporting materials on core topics that are delivered according to a set schedule through the course of each 4-week rotation block. A description of the “Student Seminar” series can be found on the clerkship website:
<http://courses.washington.edu/med610/seminars.html>.

In addition to revising our weekly didactic series I also created a website to support the clerkship and provide additional educational materials. The URL for the website is: <http://courses.washington.edu/med610>. The website includes a series of web pages with educational content on core topics in the field of Pulmonary and Critical Care Medicine. Each of these pages has a tutorial, which were written by me or by one of my division colleagues, a series of patients cases which I wrote myself and links to additional web-based educational resources. The materials have been converted over to a Canvas site that is not accessible to those not enrolled in the clerkship but the original material remain on the website at the URLs noted below. The education pages are as follows:

- Arterial Blood Gases: <http://courses.washington.edu/med610/abg/index.html>
- Cardiopulmonary Exercise Testing:
<http://courses.washington.edu/med610/cpet/index.html>
- Mechanical Ventilation:
<http://courses.washington.edu/med610/mechanicalventilation/index.html>
- Pleural Effusions:
<http://courses.washington.edu/med610/pleuraleffusion/index.html>
- Pulmonary Function Testing:
<http://courses.washington.edu/med610/pft/index.html>
- Radiology: <http://courses.washington.edu/med610/radiology/index.html>

I also assembled a series of review articles that are housed in an E-reserves account that students can access in order to find information about patient diseases that they are seeing as part of their work on the service. This “Pulmonary Library” can be found at the following URL: <http://courses.washington.edu/med610/secure/library.html>.

Results: Faculty have expressed increased satisfaction with the revised Student Seminar series as the availability of pre-prepared teaching materials has decreased the

amount of preparatory time needed by each attending physician and increased the number of topics on which attending physicians are willing to teach. Numerical evaluations from the students on the usefulness of the written/electronic materials for the clerkship on a scale from 1(poor) to 6(excellent) are as follows:

2011-2012	2012-13	2013-14
5.59	5.56	5.36

A representative sample of written comments from the students regarding the resources on the website and student seminar materials include the following:

"The online learning module by Dr. Luks was great, very informative and easy to read!"
"The course website is a fantastic resource." *"The Med610 website is excellent-lots of information appropriate to our level, easy to access."* *"I found the website to very helpful and easy to navigate."* *"The electronic resources for this course were fantastic. The introductory presentations on the various topics, external resources, and example cases all were very helpful."* *"The website was very helpful! The tutorials and cases were great and the orientation info regarding schedules was also beneficial."*

Education Scholarship Related To This Curriculum: Two learning modules on the clerkship website have been peer-reviewed and accepted for publication by MedEdPortal. Another is being prepared for submission. They include:

- A Primer on Reading Chest Radiographs. This primer can be accessed at the following URL: <http://courses.washington.edu/med610/radiology/index.html>
The NLM listing for this resource is:
Luks AM, Takasugi J, A Primer on Reading Chest Radiographs. MedEdPORTAL; 2010. Available from: <http://www.mededportal.org/publication/8004>
- Introduction to Cardiopulmonary Exercise Testing. This primer can be accessed at the following URL: <http://courses.washington.edu/med610/cpet/index.html>
The NLM listing for this resource is: **Luks AM**, Glenny R, Robertson H, Introduction to Cardiopulmonary Exercise Testing. MedEdPORTAL; 2010. Available from: <http://www.mededportal.org/publication/8005>
- A Tutorial In Pulmonary Function Testing. With the help of Ali Bays, a former Internal Medicine resident and Brian Valentine, a web programmer for the residency program, I created a web-based interactive tutorial on pulmonary function testing, which we are preparing to submit to MedEdPortal in the next few months. This tutorial was originally presented in a non-interactive format. After receiving feedback from a Program Directors meeting for Internal Medicine residency programs, we created the interactive tutorial, which can be viewed at the following URL:
<https://depts.washington.edu/uwmedres/Library/eLearning/Pulmonary/>

Med 620/621 Sub-internship in Critical Care Medicine

Background: At the time I became a faculty member, fourth year medical students had very limited opportunities for training in critical care medicine. Aside from the Trauma-Surgical ICU rotation at Harborview Medical Center, the Surgical ICU rotation at the VA Medical Center and scattered opportunities to follow ICU patients on a medicine ward rotation in their required medicine clerkship, there were no other opportunities for ICU rotations and, in particular, no Medical ICU rotations available to students in Seattle.

What Was Done: I created a sub-internship for fourth year medical students in the Medical ICU. The clerkship was approved by the School of Medicine in the fall of 2008 and since that time has expanded such that students can now do rotations at either Harborview Medical Center, the University of Washington Medical Center or the Veterans Affairs Medical Center. (One student may train at each site during each 4-week rotation block). A description of the rotation can be found on the clerkship website: <http://courses.washington.edu/med620/index.html>. I created the content for the website and included many of the same education-based pages that I created for the Med 610 website, described above. I also lead a weekly lecture series for the subinterns at Harborview Medical Center and set up a plan for weekly lecture series at each of the other sites (due to the nature of ICU work, the students cannot leave their sites easily to go to off-site teaching sessions).

Results: The average overall ratings for the clerkship since 2009, on a scale from 1 (poor) to 6 (excellent), are provided in the table below:

Item	2009-10	2010-11	2011-12	2012-13	2013-14
Overall clerkship rating	5.8	5.8	5.9	5.9	6.0

Evaluations for 2014-2015 are not available as of the time this portfolio was assembled.

A sample of comments from the students from both the formal evaluation system and email communications I have received from the students includes the following:

"In a nutshell, it was a fantastic rotation. I don't hesitate to say it was the most exciting and educational rotation I have completed yet. I feel lucky for the opportunity to work in the ICU, and furthermore for all the wonderful teaching I received from interns, seniors, fellows and attendings. Maybe I was lucky, but the ICU team made me excited for work everyday. The pathology and acute care was also very new and stimulating. There was certainly a steep learning curve, but that is something I enjoy in a rotation. Ultimately, the rotation further boosts my encouragement for a medicine residency."

"I think that overall, the experience has been fantastic. I feel that I have learned an amazing amount of information and feel more prepared to work with individuals who are so incredibly sick. All of the team members have been great in making me a lead in the care of my patients while being cognizant of what my role should be. I found that my

schedule was perhaps the best of either the seniors or interns in terms of patient continuity.”

“I feel like I had a role on the team, that I relieved a lot of pressure when the census was high and that I learned a ton about critical care and medicine while I was there. The rotation required a really fast adjustment to how things go in the ICU and I think I was able to achieve that and have a really good time. It was the first time that I have taken care of patients, worked really hard to help them recover, and frequently they passed away due to their critical illness despite my interventions. This was really difficult but also was really meaningful. The subInternship was a motivational experience, made me even more excited to be a physician that I already was. I am even more sure now that whatever I do it will involve critical care medicine.”

“This rotation has been an amazing journey and truly has been by far the most challenging, learning intense and rewarding rotation yet. I'm coming up on my last few days and am really sad to see the finish line in sight.”

“The website and materials provided for this course were by far the best of any rotation I've been on thus far. Very well organized and very helpful for understanding basic concepts/ skills used in critical care medicine. This was a great sub-I and I would recommend it highly to everyone.”

“As I finish up my medical school career it is easy for me to say in earnest that this has been one of the best and most useful rotations that I have taken. From the attendings impromptu whiteboard lectures, to daily imaging findings, to the website and syllabus; I truly could not ask for more from a rotation. Dr. Luks has done a great job constructing this course and it has truly benefited my overall medical education.”

Education Scholarship Related To This Curriculum: No scholarly publications have been created from this course.

American Thoracic Society International Conference Post-Graduate Seminars

Background: Prior to the start of the International Conference, the American Thoracic Society (ATS) conducts two days of post-graduate seminars. The majority of the seminars are related to clinical topics such as care of the patient with interstitial lung disease or exercise testing more research oriented subjects such as innate immunity or research methods. Traditionally, respiratory physiology has not received a lot of attention in these educational sessions. This has happened despite the fact that respiratory physiology remains a core skill for practicing pulmonary and critical care physicians and skills in this area appear to be on the wane. In 2009, I was invited to speak as part of a physiology-oriented seminar and the following year was asked to assume the leadership of this post-graduate seminar.

What Was Done: On an annual basis since 2010, I have submitted proposals for and been granted permission to run post-graduate seminars ATS International Conference that are focused on cardiorespiratory physiology. Along with my co-chair, Robb Glenny, I have created a recurring three year series of seminars that has included the following topics:

- 2010: Master Physiology Class
- 2011: Physiology Master Class: Hemodynamic Assessment and Management in the ICU
- 2012: Master Physiology Class: Common Pulmonary Diseases From a Physiologic Perspective
- 2013: Respiratory Physiology Master Class
- 2014: Master Physiology Class: Hemodynamics
- 2015: Master Physiology Class: Common Pulmonary Diseases From a Physiologic Perspective

As Co-chair for the seminar, I am responsible for planning the curriculum and organizing the course faculty that includes members from North America and Europe.

Results: Our seminars have continued to be one of the more highly attended seminars each year. Seminar registration and overall course numerical ratings on a scale from 1 (poor) to 5 (excellent) are available from 2010 to 2014:

Dimension	2010	2011	2012	2013	2014	2015
Number of Registrants	75	92	98	74	67	80
Overall Rating	4.56	4.52	4.69	4.73	4.57	4.52

In addition to organizing and conducting the seminars, I have also given lectures as part of each seminar. On a scale of 0 (low) to 5 (exceptional) the scores on the evaluation for my lectures, with comparison to the other speakers in the seminar, are as follows:

Dimension	2010	2011	2012	2013	2014
Content communicated at level that met my expectations	4.60	4.46	4.65	4.75	4.75
Presentation skills were engaging	4.73	4.39	4.71	4.69	4.72
Overall, I would recommend this speaker to a colleague	4.70	4.42	4.74	4.75	4.75
Overall score	4.62	4.42	4.72	4.78	4.76
Average overall score for peers	4.51	4.42	4.53	4.71	4.58

I did not deliver a lecture as part of the 2015 course and, instead, was responsible for organizing and preparing the materials for small group break-out sessions, which were a new, well-received part of the course this year. Written comments from the learners specifically addressing my lectures are not available.

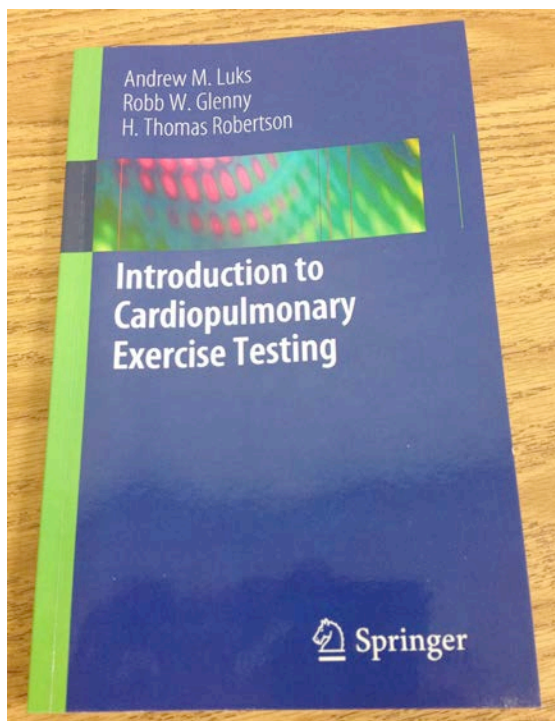
Education Scholarship Related To This Curriculum: No scholarly publications have been created from this course.

Education Scholarship

Textbooks

I am an author on two textbooks currently in publication and another book slated for publication later this year. These projects include:

Introduction to Cardiopulmonary Exercise Testing



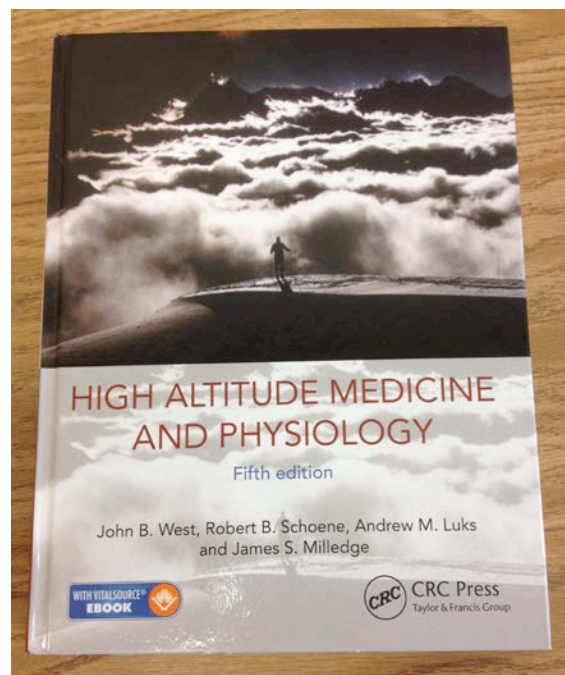
Fellows in pulmonary and critical care medicine receive training in cardiopulmonary exercise testing, an important diagnostic modality in this field. A key problem, however, is that many of the standard textbooks on the topic are far too dense and lengthy to be of use to the fellows in their efforts to learn this material during what is a very busy year of clinical training. To help address this problem, in 2007-2008, I wrote a primer on cardiopulmonary exercise testing for use by fellows in our program that is considerably more concise than other materials in this field.

The primer was originally submitted for peer review at MedEdPortal and accepted for publication. The NLM listing for the publication is: : Luks AM , Glenny R, Robertson H, Introduction to Cardiopulmonary Exercise Testing. MedEdPORTAL; 2010. Available from: <http://www.mededportal.org/publication/8005>. The resource has been downloaded 54 times since its publication on the site. In reference to the submission, one of the peer reviewers stated the following: *"This syllabus is truly one of a kind. There are no other resources that could address the principles of CPET as well-balanced as this one. CPET is often perceived as a complicated subject matter. Many learners spend considerable amount of time to capture the concepts from various resources. The knowledge retention, however, is problematic due to its complexity. To residents,*

fellows or even faculty who do not interpret CPET everyday, this syllabus is the great solution to their learning frustration. The content provides just the right amount of basic physiology and clinical relevance. The content is not too basic nor too deep. The case examples make the topic relevant and practical.”

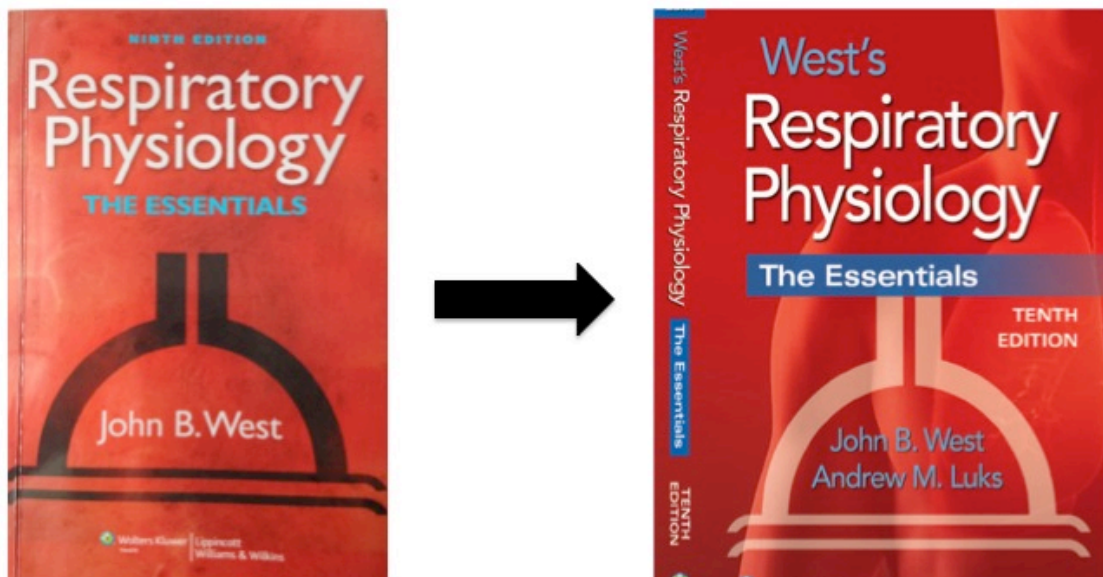
Subsequently, in 2013, the primer was published as a textbook for national and international distribution (depicted in the photo above). The complete citation is: Luks AM, Glenny RW, Robertson HT. Introduction to Cardiopulmonary Exercise Testing. New York: Springer. 2013. Since its publication, there have 444 purchases of the hardcopy of the book and 4,700 downloads of the PDF version from the publisher's website as of March 1, 2015. A review of the book can be found at the following URL: <http://err.ersjournals.com/content/22/130/591.full>

High Altitude Medicine and Physiology



For many years, High Altitude Medicine and Physiology has been one of the leading textbooks on this topic. After one of the original authors passed away, I was invited by the remaining authors, John West, Jim Milledge and Robert “Brownie” Schoene, three leading figures in this field, to become an author for the new fifth edition of the text. The book was released in 2013 and has an international distribution. As part of the project, I rewrote 7 of the book's 29 chapters. The complete citation is: West JB, Schoene RB, **Luks AM**, Milledge JS. High Altitude Medicine and Physiology. Fifth Edition. Boca Raton: Taylor & Francis Group. 2013. Book reviews are not available at this time. I do not have data on book sales.

West's Respiratory Physiology



Respiratory Physiology: The Essentials has long been one of the standard respiratory physiology textbooks. This past year, I was asked by John West to become a co-author for the upcoming tenth edition of the book, which will be renamed “West’s Respiratory Physiology.” This was one of the highlights of my career thus far as I learned my respiratory physiology from Dr. West while in medical school at the University of California, San Diego. In addition to helping to revise the main text, I contributed to the development of new patient vignettes at the end of each chapter and wrote new multiple choice questions for the end-of-chapter study questions. The book is currently in press and slated for release in mid-late 2015.

Other Peer-reviewed Educational Publications

- **A Primer on Reading Chest Radiographs**

As part of the educational materials created in support of Med 610 and Med 620, described above, I created a radiology tutorial. Originally designed in a PowerPoint format, the tutorial is now available in a web-based format. The web-base version can be accessed at the following URL:

<http://courses.washington.edu/med610/radiology/index.html>

The primer was submitted for peer review at MedEdPortal and accepted for publication. The NLM listing for the publication is: **Luks AM**, Takasugi J, A Primer on Reading Chest Radiographs. MedEdPORTAL; 2010. Available from: <http://www.mededportal.org/publication/8004>

Downloads: As of August 1, 2011, the resource has been downloaded 136 times from MedEdPortal.

- **Introduction to Critical Care Medicine**

The curriculum for Med 536 Introduction to Critical Care Medicine was submitted for peer review at MedEdPortal and accepted for publication in May 2011. The NLM listing for the publication is: **Luks AM**, King M, Early Introduction to Critical Care Medicine: An Elective Course for Second Year Medical Students .MedEdPORTAL; 2011. Available from: <http://www.mededportal.org/publication/8240>

Downloads: As of August 1, the resource has been downloaded 95 times from MedEdPortal.

- **Really Good Stuff Publications in the journal Medical Education**

Luks AM. An alternative means for obtaining student feedback. Med Educ 2007. 41(11): 1108-1109.

Luks AM, Yukawa M, Emery H. Disseminating Best Practices for the Educator's Portfolio. Med Educ. 2009. 43(5): 497-498.

Luks AM, King M. Early Introduction to Critical Care Medicine. Med Educ 2011. 45(5): 515.

Other Peer-reviewed Educational Materials

- **Review Articles**

Luks AM, Swenson ER. Travel to High Altitude With Preexisting Lung Disease European Respiratory Journal 2007 29(4): 770-772.

Luks AM, Swenson ER. Medication and dosage considerations in the prophylaxis and treatment of high altitude illness. Chest 2008. 133(3): 744-755.

Luks AM, Johnson RJ, Swenson ER. Chronic kidney disease at high altitude: risks and management. J Amer Soc Nephrol 2008. 19(12): 2262-2271.

Luks AM. Do we have a "best practice" for the treatment of high altitude pulmonary edema? High Alt Med Biol. 2008. 9(2): 111-114.

Luks AM. Which medications are safe and effective for improving sleep at high altitude? High Alt Med Biol. 2008. 9(3): 195-198.

Luks AM. Should travelers with hypertension adjust their medications when traveling to high altitude? *High Alt Med Biol.* 2009. 10(1): 11-15.

Luks AM. Can patient with pulmonary hypertension travel to high altitude? *High Alt Med Biol.* 2009. 10(3): 215-219.

Luks AM. Do Lung Disease Patients Need Supplemental Oxygen at High Altitude? *High Alt Med Biol.* 2009. 10(4): 321-327.

Stream JO, **Luks AM**, Grissom CK. Lung disease at high altitude. *Expert Rev Resp Med.* 2009. 3(6) 635-650.

Luks AM, McIntosh SE, Grissom CK, Auerbach PS, Rodway GW, Schoene RB, Zafren K, Hackett PH. Wilderness Medical Society consensus guidelines for the prevention and treatment of acute altitude illness. *Wilderness Environ Med.* 2010. 21(2): 146-155.

Luks AM, Stout K, Swenson ER. Evaluating the safety of high altitude travel in patients with adult congenital heart disease. *Congenital Heart Dis.* 2010. 5(3): 220-232.

Luks AM, Swenson ER. Pulse Oximetry at High Altitude. *High Alt Med Biol.* 2011. 12 (2): 109-119.

Luks AM. What Do We Know About Safe Ascent Rates at High Altitude. *High Alt Med Biol.* 2012. 13(3): 147-152.

Luks AM. Ventilatory Strategies and Supportive Care in ARDS. *Influenza and Other Respiratory Viruses.* 2013. 7 (suppl 3): 8-17.

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- **HuBio 541 The Respiratory System Course Syllabus**

This course is part of the core second year medical student curriculum. I co-authored original versions of 5 of the current syllabus chapters:

- Pulmonary Vascular Disease (co-author: Robb Glenny)
- Evaluation of the Pleural Space and Pleural Disorders (co-author: David Pierson)
- Cardiac and Respiratory Responses to Exercise (co-author: H. Thomas Robertson)
- Respiration at the Extremes (co-authors: Erik R. Swenson, H. Thomas Robertson)
- Acute Respiratory Failure (co-author: David Pierson)

In addition, as Course Chair, I am now responsible for editing and publishing the course syllabus. In the past several years, I have rewritten nearly the entire syllabus including revisions all of the figures in the syllabus. I have also revised all of the small group materials used in the course creating a new set of questions, answer keys and instructor preparation documents. These materials have only been used on a local basis.

Web-based Materials

As part of my work directing clerkships and elective courses in the School of Medicine, I have created multiple distinct websites. I wrote and organized much of the content of these websites. I created the Med 534 and Med 536 Catalyst sites myself while the Med 610 and Med 620 sites were created with the help of Barbara MacFadden from Health Sciences Center for Educational Resources and pulmonary function test interpretation tutorial was created with the help of Brian Valentine in the Department of Medicine. The websites are as follows:

- **Med 534 Wilderness Medicine Elective**

This site was designed to provide structure to the elective course. It included links to the syllabus reading materials, the course schedule and other resources for the students to explore in this field. It is for local use only. The website URL is:

<https://catalyst.uw.edu/workspace/aluks/14126/>

In 2015, the site was replaced by a new Canvas-based website which is only accessible by students enrolled in the course.

- **Med 536 Introduction to Critical Care Medicine**

This site was designed to provide structure to the elective course. It included links to the syllabus reading materials, the course schedule and other resources for the students to explore in this field. It is for local use only. The website URL is:

<https://catalyst.uw.edu/workspace/aluks/14127/>

In 2015, the site was replaced by a new Canvas-based website which is only accessible by students enrolled in the course.

- **Med 610 Fourth-year Medical Student Clerkship in Pulmonary Medicine**

This site was designed to support student activities and learning during their participation in this 4th year clerkship. The website URL is:

<https://courses.washington.edu/med610>

In 2015, the site was replaced by a new Canvas-based website which is only accessible by students enrolled in the clerkship. The old site is still visible, however, and many of its features are open to public access.

- **Med 620/621 Fourth-year Medical Student Subinternship in Critical Care Medicine**

This site was designed to support student activities and learning during their participation in this 4th year subinternship. The website URL is:

<https://courses.washington.edu/med620>

Many of the features of the site are open to public access.

- **A Tutorial in Pulmonary Function Test Interpretation**

In 2008, I created a tutorial in Pulmonary Function Test Interpretation that was accessible through the website for Med 610, described above. This tutorial was originally presented in a non-interactive format. After receiving feedback from a Program Directors meeting for Internal Medicine residency programs that the tutorial could be improved with the help of interactive features, I worked with a

resident trainee in Internal Medicine, Ali Bays, and a web-designer at our institution, Brian Valentine, to create an interactive, on-line version. The tutorial can be viewed at the following URL:

<https://depts.washington.edu/uwmedres/Library/eLearning/Pulmonary/>

Presentations at Regional / National / International Meetings

Regional Meetings

Meeting	Dates	Lectures
American College of Physicians: Internal Medicine Board Review Course	Lectures given from 2006 to present	<ul style="list-style-type: none"> • Pulmonary Pearls for the Boards (2006 to present) • Obstructive Lung Disease (2011-present) • Critical Care Medicine (2012) • Venous Thromboembolism (2012)
University of Washington CME: Current Concepts in Drug Therapy	April 2010	Management of Obstructive Lung Disease
University of Washington CME: Update in Travel Medicine and Global Health	June 2010, 2011 and 2014	Advising the Traveler to High Altitude
American College of Physicians Washington Chapter Annual Meeting	November 2013	Sepsis Management: Moving Beyond the Basics of Early Goal-Directed Therapy
21 st Annual John Butler Lung Conference	September 2014	Evaluating the Traveler to High Altitude

National Meetings

Meeting	Dates	Lectures
Wilderness Medical Society Annual Meeting	July 2009	Travel to High Altitude With Preexisting Medical Conditions
American Association of Respiratory Care 55 th Annual Respiratory Care Conference	December 2009	<ul style="list-style-type: none"> • The Pulmonary Effects of Illicit Drugs • Caring for the Patient With Traumatic Brain Injury • When Your COPD Patient Travels to High Altitude
American Association of Respiratory Care 56 th Annual Respiratory Care Conference	December 2010	<ul style="list-style-type: none"> • Update on Altitude-Related Illnesses • Physiology and Complications of Diving • Back to Basics: How Oxygen and Carbon Dioxide are Transported in the Blood

Lectures at international meetings are listed on the following page

International Meetings

Meeting	Dates	Lecture Titles
American Thoracic Society International Conference	May 2009	Post Graduate Seminar 27: Pulmonary Patients at High Altitude
American Thoracic Society International Conference	May 2010	Post Graduate Seminar 28: High Altitude Physiology
International Society of Mountain Medicine World Congress	August 2010	<ul style="list-style-type: none"> • Cardiac Disease Patients at High Altitude • Kidney Disease Patients at High Altitude
American Thoracic Society International Conference	May 2011	Post Graduate Seminar 14: Less Invasive Hemodynamic Monitors in the ICU.
The Impact of Hypoxia on Cells, Mice and Men	October 2011	General Measures for the Prevention and Treatment of High Altitude Pulmonary Edema: Acclimatization
American Thoracic Society International Conference	May 2012	<ul style="list-style-type: none"> • Post Graduate Seminar 8: Parasitic Lung Diseases • Post Graduate Seminar 25: Physiology at Work in the ICU
International Society on Influenza and Other Respiratory Viruses Meeting: Severe Influenza	October 2012	Ventilatory Strategies, Fluid Management and Supportive Care in ALI/ARDS
High Altitude Tolerance: A Symposium Honoring Peter Bärtsch	January 2013	Pulmonary Patients at High Altitude
American Thoracic Society International Conference	May 2013	<ul style="list-style-type: none"> • Post Graduate Seminar 20: High Altitude Physiology • Sunrise Seminar: Nematodes, Flatworms and Flukes...Oh My! A Review of Parasitic Lung Diseases • Center for Career Development Panel Discussant: Clinician Educator Careers
American Thoracic Society International Conference	May 2014	<ul style="list-style-type: none"> • Post Graduate Seminar 6: Parasitic Lung Diseases • Post Graduate Seminar 21: Core Physiologic Principles: The Splanchnic Circulation • Meet The Professor Seminar: "How High Can They Go: Advising Patients Planning High Altitude Travel." • Panel Discussant: "The Roadmap to Success in Early Academic Career Development: Your First Five Years." • Education Workshop: How to Effectively Use PowerPoint Part 1: Delivery, Time Management and Talk Structure.

Additional presentations at international meetings are listed on the following page.

International Meetings (continued)

Meeting	Dates	Lecture Titles
International Society of Mountain Medicine World Congress	May 2014	Cardiac Patients at High Altitude 1: Coronary Artery Disease and Heart Failure
American Thoracic Society Section on Medical Education Webinar	April 2015	Practical Tips for Large Group Presentations Using PowerPoint
American Thoracic Society International Conference	May 2015	<ul style="list-style-type: none"> • Post Graduate Seminar 21: Chest Radiograph Interpretation • Pulmonary Clinical Core Curriculum: Pulmonary Physiology • Meet The Professor Seminar: "Why Is My Patient Dyspneic? A Review of Cardiopulmonary Exercise Testing." • Panel Discussant: "The Roadmap to Success in Early Academic Career Development: Your First Five Years." • Education Workshop: How to Teach on the Fly: A Workshop for Intensive Care Educators. "Attention."

A high-angle photograph of a vast, snow-covered mountain range. The central peak is prominent, with its ridges and gullies covered in thick white snow. The foreground shows a steep, snow-laden slope with some dark rocks visible. The sky is a pale blue with a few wispy clouds. The overall scene is serene and majestic.

Section 5

Professional Development in Education

Section 5: Professional Development in Education

Teaching Scholars Program

In 2006-2007, I completed the University of Washington Teaching Scholars Program run by Lynne Robins and Jan Carline. This is a year-long program that meets once a week and provides faculty and other trainees with strong interests in teaching exposure to all facets of medical education such as learning theory, curriculum development, web-based teaching materials, education scholarship, and providing feedback.

As part of my work in the program I completed two scholarly projects:

- **Resident Perceptions of The Educational Value of Night Float Rotations:** Working with Joyce Wipf, C. Scott Smith and Lynne Robins, I conducted a survey of all internal medicine residents to determine their impressions of the educational value of night float rotations, a growing part of residency training in the era of work-hour limitations. The study was published in *Teaching and Learning in Medicine*. The official citation is: Luks AM, Smith CS, Robins L, Wipf J. Resident Perceptions of the Educational Value of Night Float Rotations. *Teach Learn Med*. 2010. 22(3): 196-201.
- **Demystifying the Educator's Portfolio:** As discussed in the Teaching Activities section of this portfolio, I worked with members of my Teaching Scholars cohort to develop a template for the Educator's Portfolio which has since been disseminated within the School of Medicine. We delivered faculty development workshops on this topic in 2008, 2010 and 2012. I have also given shorter lectures about portfolios at the Faculty Development Days Workshop offered by Dr. Chris Surawicz in 2008, 2011, 2013, 2014 and 2015 as well as at faculty development sessions run by the Division of Emergency Medicine (2013), the Department of Obstetrics and Gynecology (2012, 2014) and the Hospitalist Medicine Program (2014).

A peer-reviewed Really Good Stuff abstract was published in *Medical Education* describing our project and the workshop. The citation for this publication is: Luks AM, Yukawa M, Emery H. Disseminating Best Practices for the Educator's Portfolio. *Med Educ*. 2009. 43(5): 497-498.

Impact on My Professional Development: The Teaching Scholars program remains the formative experience in my development as a faculty member. Put simply, it opened my eyes and showed me that being a successful clinician-educator involves far more than giving engaging lectures or doing a good job of teaching on rounds. Without the tools I learned as part of this program and, in particular, the importance of education scholarship, I would not have been able to accomplish the things I have accomplished thus far. Beyond gaining these invaluable tools, I also developed relationships with other members of the faculty with whom I might never have had a reason to interact. Many of these relationships continue to this day and have been valuable in my ongoing work.

Faculty Development Workshops

In addition to my work in the Teaching Scholars Program, I have taken part as a learner in the following faculty development workshops in the School of Medicine:

- Teaching Ethics to Residents. October 2006
- Masterful Teaching in the Information Age: Beyond Powerpoint. January 2007
- Faculty Development Days. February 2008
- UW Teaching Academy's Collegium on Large Classroom Instruction. April 2009
- Giving Feedback to Difficult Learners. April 2010
- Improving Our Mentoring Culture in UW Medicine. October 2010
- Large Class Teaching Workshop. March 2011
- Small Group Teaching Workshop. March 2011
- Large Group Teaching Workshop. November 2012
- Low Risk and High Tech Approaches to Making Your Lectures More Interactive. December 2012
- ACP Internal Medicine Board Review Course. July 2013.

Participation as an Educator in Programs Related to Medical Education

I have served as course faculty in many continuing education programs including:

- ACP Internal Medicine Board Review: I have delivered a lecture entitled "Pulmonary Pearls for the Boards" on an annual basis since 2006. Since 2011, I have also delivered a lecture on "Obstructive Lung Diseases."
- ACP-Washington Chapter Annual Update: I delivered a lecture on "Sepsis Management: Moving Beyond the Basics of EGDT" in 2013.
- American Thoracic Society Post-Graduate Seminars: On an annual basis since 2010, I have served as co-chair for post-graduate courses. In 2012, 2014 and 2015, I also served as faculty/lecturer in another post-graduate course. My role in these courses is described in greater detail in the Teaching Activities section of this portfolio.
- American Thoracic Society International Conference Workshops: In 2014, I delivered a lecture entitled "How to Use PowerPoint: Delivery and Talk Structure" in the workshop "Speak Like a Pro." The information presented in my talk and the workshop as a whole has been written up in manuscript form and is now in press: Lenz PH, McCallister JW, Luks AM, Le T, Fessler HE. Practical Strategies for Delivering Effective Large Group Lectures. Ann Am Thorac Soc 2015. 12(4): 561-566. In 2015, I delivered a lecture entitled "Attention" in a workshop on bedside education in the intensive care unit.

- Demystifying the Educator's Portfolio: As described in Section 4 of this portfolio, I helped organize and deliver this faculty development workshop at the University of Washington in 2008, 2010 and 2012.
- Mountain Medicine Refresher Course: In 2009, I delivered lectures entitled "Pulmonary Patients at High Altitude" and "Medical Care in Remote Areas of Nepal" at this course offered by a German colleague, Dr. Peter Bärtsh from the University of Heidelberg.
- UW CME-Current Concepts in Drug Therapy: I delivered a lecture on "Management of Obstructive Lung Disease" in 2010.
- UW CME-Update in Travel Medicine and Global Health: In 2010, 2011 and 2014, I delivered a lecture entitled "Advising the Traveler to High Altitude."
- UW School of Medicine Faculty Development Programs: I have served as faculty in the following faculty development programs run by Dr. Chris Surawicz:
 - Transition from Assistant to Associate Professor: delivered lecture entitled "Practical Advice for the Teaching Portfolio" in 2008, 2011, 2013, 2014 and 2015.
 - Large Group Teaching Workshop: During the workshops in 2012 and 2014, I delivered the primary lecture entitled "Practical Advice for Excellent Large Group Lectures" and served as a small group facilitator. I am slated to deliver this lecture again at the next workshop scheduled for November 2015.

Connection to the Community of Educators

Aside from my participation as faculty in the workshops described above, there are several activities that demonstrate my ongoing commitment to the larger community of educators within my division, my professional society and the School of Medicine.

- American Thoracic Society – Medical Educator Working Group: Clinician educators have traditionally had a limited role in the American Thoracic Society. I participated in a working group designed to increase exposure of clinician-educators in the Society and contributed to efforts to help our cohort obtain official section status within the organization.
- Center for Leadership and Innovation in Medical Education (CLIME) – Learning Community on Active Learning. In the fall of 2014 and winter of 2015, I participated in separate learning communities dedicated to helping faculty incorporate active learning strategies in their classrooms. This program provided an opportunity to interact with and learn from faculty across multiple departments within the School of Medicine.
- HuBio 541 Working Group: As part of efforts to improve our second year medical student respiratory physiology and pathophysiology course, I convened and lead a

small working group of educators within my division whose goal is to develop teaching materials for the course, review our current practices and consider broader issues of how we are educating the students in this course. This group is now working on preparations for the pulmonary medicine component of the new curriculum.

- Pulmonary and Critical Care Medicine Clinician-Educator Working Group: As part of my work in the Division, I take part in a monthly working group run by Dr. Joshua Benditt in which we work on a variety of educational projects within the division such as our division-wide weekly educational conference, a feedback coach program for faculty members giving talks in the division, a mentoring system for junior faculty and a faculty development program for the division's clinician-educators.
- UW School of Medicine Pre-Curriculum Review Committee: I served on a committee convened by Dr. Paul Ramsey to assess the strengths and weaknesses of the current curriculum and develop a rationale, set of guiding principles and proposed approach to the curriculum renewal process that is now underway in the School of Medicine. Chaired by Drs. Michael Ryan and Suzanne Allen, this committee provided a strong connection to the broader School of Medicine community as our work involved meeting with and listening to stakeholders from all segments of the School.
- UW School of Medicine Curriculum Renewal – Patient Care Phase Committee: Along with Hugh Foy from the Department of Surgery, I co-chaired this committee from November 2012 to April 2014. The primary mission of the committee was to consider the timing and structure of the Patient Care Phase (a.k.a required clerkship phase) of the new curriculum. This was my first experience chairing a formal committee within the School of Medicine.
- UW School of Medicine Curriculum Renewal – Patient Care Committee: From 2013 to 2014, I served on this committee chaired by Mark Whipple from the Department of Otolaryngology and Richard Veith from the Department of Psychiatry. The role of this multidisciplinary committee was to build on the work of the committee I chaired in the previous iteration of the curriculum renewal process and provide further input into the creation of the Patient Care Phase of the new curriculum.



Section 6

National and International Recognition

Section 6: International / National / Regional Recognition

International Roles and Recognition

High Altitude Medicine and Physiology

One of my major academic interests continues to be high altitude physiology and medicine and within that area, I have done a considerable amount of work examining the safety of high altitude travel in people with underlying medical problems. Through this work, I have had the following opportunities at an international level.

- **High Altitude Medicine and Biology, Associate Editor:** This is the primary journal devoted to the topic of high altitude medicine and physiology. I have served in this editorial role since 2009 and am responsible for the Clinician's Corner section of the journal.
- **High Altitude Tolerance: A Symposium Honoring Peter Bärtsch, 2013. Heidelberg, Germany.** I was invited to deliver a lecture entitled "Pulmonary Patients at High Altitude" at this conference that included an international roster of speakers.
- **International Hypoxia Symposium:** Held on a bi-annual basis, this is one of the leading international meetings on mountain medicine and the physiology of hypoxia. Since 2011, I have served on the Symposium's Advisory Board.
- **International Society of Mountain Medicine, Executive Committee.** The ISMM is a professional society dedicated to the link between mountaineering and medicine. I have served as an Ex Officio member of this committee since 2009.
- **International Society of Mountain Medicine 2010 World Congress, Arequipa, Peru:** I was invited to give two lectures at the meeting, "Cardiac Patients at High Altitude" and "Kidney Disease Patients at High Altitude."
- **International Society of Mountain Medicine 2014 World Congress, Bolzano, Italy:** I was invited to give a lecture at the meeting entitled "Cardiac Patients at High Altitude I: Coronary Artery Disease and Heart Failure."
- **Monte Verità Hypoxia Symposium 2011:** I was invited to speak on the topic of "High Altitude Acclimatization" at this meeting in Ascona, Italy.
- **Wilderness Medical Society Guidelines for the Prevention and Treatment of Acute Altitude Illness:** I participated in a 2009 consensus conference to develop these guidelines and served as the lead author on the guidelines paper that

emerged from the meeting and was published in 2010. I also served as lead author for an updated version of the guidelines published in 2014.

My work in this area has also led to several important scholarly opportunities:

- I was invited to be a co-author for the 5th Edition of the textbook High Altitude Medicine and Physiology, one of the leading textbooks in this field. The complete citation can be found in my curriculum vitae.
- I was invited to serve as co-author for two chapters in the upcoming 6th edition of Auerbach's Wilderness Medicine, the leading textbook in the field of wilderness medicine. One chapter is currently in press while the other is nearing submission. The chapters include:
 - Luks AM, Hackett PH. High Altitude and Pre-existing Medical Conditions.
 - Hackett PH, Lawley J, Luks AM, Roach R. Acute High-Altitude Medicine and Pathophysiology.

Complete citations can be found in my curriculum vitae.

- I served as co-author on two chapters in another important textbook in the field of high altitude medicine and physiology edited by Peter Bartsch and Erik Swenson, two of the leading figures in the field. The chapters include:
 - Luks AM, Hopkins SR. Pulmonary Function and Gas Exchange.
 - Luks AM, Hackett PH. High Altitude and Common Medical Conditions.

Complete citations can be found in my curriculum vitae.

- I was invited by the Journal of Applied Physiology, one of the leading journals in this area, to write a review article entitled Physiology in Medicine: A Physiologic Approach to Prevention and Treatment of Acute High Altitude Illnesses

A complete citation can be found in my curriculum vitae.

Other National / International Roles

In addition to these roles related to high altitude physiology and medicine, I have had the following other international roles:

- **American Thoracic Society (ATS) International Conference**

Post Graduate Seminars: In addition to delivering a lecture in a post-graduate seminar at the 2009 International Conference, I have served as co-chair of a post-graduate course related to cardiorespiratory physiology on an annual basis at the

conference since 2010. The topics for these well-attended courses and the lectures I delivered as part of them, have included:

- 2010: Master Physiology Class. Lecture: "High Altitude Physiology"
- 2011: Physiology Master Class: Hemodynamic Assessment and Management in the ICU. Lecture: "Less Invasive Hemodynamic Monitors in the ICU"
- 2012: Master Physiology Class: Common Pulmonary Diseases From a Physiologic Perspective. Lecture: "Physiology at Work in the Intensive Care Unit"
- 2013: Respiratory Physiology Master Class. Lecture: "High Altitude Physiology"
- 2014: Master Physiology Class: Hemodynamics. Lecture "Core Physiologic Principles: The Splanchnic Circulation"
- 2015: Master Physiology Class: Common Pulmonary Diseases From a Physiologic Perspective. Rather than delivering a lecture, I organized and prepared the materials for the small group breakout sessions and led my own group during those sessions.

In addition to organizing and leading these workshops, I have also been invited to deliver lectures as part of other Post Graduate Seminars in 2012, 2014 and 2015.

Maintenance of Certification Curriculum: Since 2013, I have served as part of the leadership group responsible for developing and editing content and selecting and evaluating speakers for a program designed to help International Conference attendees obtain Maintenance of Certification (MOC) credit for their American Board of Internal Medicine recertification. At the 2015 International Conference, I will also deliver one of the lectures as part of this curriculum. The citation for this program can be found at the following URL:

<http://www.thoracic.org/professionals/professional-accreditation/moc/citation.php#2015cc>

Other Speaking Roles: In addition to the two major roles at the ATS International Conferences noted above, I have also served on discussion panels related to career development for clinician-educators, delivered Sunrise and Meet the Professor Seminars and served as faculty in education-related workshops. These activities are described further in Section 4 of this portfolio and in my curriculum vitae.

- **American Association of Respiratory Care International Respiratory Congress:** I was invited to give the following lectures at the 2009 and 2010 meetings:

2009

- The Pulmonary Effects of Illicit Drugs
- Caring for the Patient with Traumatic Brain Injury
- The COPD Patient at High Altitude

2010

- Update on High Altitude Medicine

- The Physiology and Complications of Diving
- Back to Basics: How Oxygen and Carbon Dioxide are Transported in the Blood

I have been invited back to speak several times since 2010 but have not been able to participate because the meeting conflicts with my primary teaching commitment in the UW School of Medicine, HuBio 541 The Respiratory System.

- **World Health Organization:** I was invited to serve on a committee that was tasked with devising, reviewing and revising a document providing interim guidance on the management of severe respiratory failure related to the Middle East respiratory syndrome (MERS). This document was released in the summer of 2015 and can be accessed at the following URL:
http://apps.who.int/iris/bitstream/10665/178529/1/WHO_MERS_Clinical_15.1_eng.pdf?ua=1

Regional Roles and Recognition

I have continued to try and develop a regional reputation in the area of high altitude medicine and to make myself a resource for other medical providers and lay people. This work has taken several forms including:

- **Grand Rounds Lectures:** I have delivered the following Grand Rounds lectures:
 - Virginia Mason Medical Center “Advising the Traveler to High Altitude.” 2009
 - Evergreen Hospital “Advising the Traveler to High Altitude.” 2010
 - Boise Veterans Affairs Medical Center. “Evaluating the Traveler to High Altitude.” 2014

I have also been invited to give Grand Rounds at the University of Washington in the fall of 2015.

- **CME Courses:** In 2010, 2011 and 2014, I delivered my lecture “Advising the Traveler to High Altitude” at the UW CME Course, “Update in Travel Medicine and Global Health.”
- **Lectures to the Lay Community:** Since 2004, I have delivered multiple lectures a year entitled “Safe Travel at High Altitudes” to various groups in the Seattle and Vancouver area including REI, Wide World Books and Maps in Wallingford, Mountain Equipment Coop and multiple climbing clubs (The Mountaineers, BoeAlps, Washington Alpine Club).
- **Clinical Work:** At the request of local providers, I see patients in clinic who had previous problems during a trip to high altitude or who have underlying medical

problems and are planning a trip that will involve exposure to high elevations. I also occasionally receive MedCon calls regarding these issues.

Additional regional speaking roles have included the following:

- **American College of Physicians Internal Medicine Board Review Course.** I have delivered a lecture entitled “Pulmonary Pearls for the Boards” at this annual course annually since 2006 and delivered a second lecture entitled “Obstructive Lung Diseases” since 2011.
- **American College of Physicians Washington Chapter Annual Meeting.** I delivered a lecture entitled “Sepsis Management: Moving Beyond the Basics of Early Goal-Directed Therapy” at the 2013 meeting.
- **University of Washington Summer Lung Day:** In 2007, I delivered a lecture entitled “Lung Disease at High Altitude” while in 2008, I delivered another lecture entitled “Advising Travelers to High Altitude.”
- **Washington Respiratory Society.** I gave two lectures at the 2010 conference entitled “The Pulmonary Effects of Illicit Drugs” and “The Lungs at High Altitude.” I was invited back to speak in 2011 but was unable to attend due to scheduling conflicts. Evaluations are not available for these lectures.
- **21st Annual John Butler Lung Conference, 2014.** I was invited to give a lecture entitled “Evaluating the Traveler to High Altitude.”

A photograph of a person standing in a narrow, deep canyon. The canyon walls are made of dark, layered rock. A bright, golden light shines from a narrow opening at the top of the canyon, creating a strong contrast with the dark interior. The person is wearing a yellow jacket and a white helmet, and is standing on a rocky path. The text "Section 7" and "Mentoring" is overlaid on the image.

Section 7

Mentoring

Section 7: Mentoring Activities

1. Group Mentoring Activities

A Guide to Applying for Pulmonary and Critical Care Fellowship: Each year, a large number of residents apply for specialty training in Pulmonary and Critical Care Medicine. Beginning in 2009, I have organized an evening session for all of the applicants designed to provide them with information on how to navigate the application process. This session has been held every year since that time with the exception of 2014. At the session, residents have the opportunity to hear informal presentations from Pulmonary and Critical Care faculty and to ask their own questions about the various aspects of the application process. Formal evaluation of the session has not been done but the informal feedback from the residents has been very positive. An example of the feedback:

"Thanks for organizing tonight's get-together - I definitely think it should be continued in future years! Despite having peppered you with questions for the last six months about fellowship, I still learned a ton."

"When I started rotating on different consult months as an R2, one of the things that struck me was the difference in divisions in terms of their interest in my (and other residents') future plans and their willingness to offer support in terms of research opportunities, discussions about fellowship, looking for jobs, etc. - the PCCM division really stands out in that regard and tonight was a great example of that."

Along with Patricia Kritek, a colleague in my division, I created a companion document for this session that is provided to all of the residents who express interest in Pulmonary and Critical Care Medicine. This document is available upon request.

2. Mentor Committee Membership

The Division of Pulmonary and Critical Care Medicine has mentor committees for all trainees and for all junior faculty members on the clinician-educator pathway. I have served or am serving on the mentoring committees for the following faculty members and fellows:

- Tyler Albert: fellowship
- Tiffany Bridges: faculty
- Başak Çoruh: fellowship and faculty
- Sunny Lim: fellowship
- Matthew Wemple: faculty

3. Individual Mentoring: Residents and Students

I have mentored the following students, residents or fellows on an individual basis:

Tyler Albert

Dates	2009-Present
Mentoring Roles	Residency Training: I served as his formal residency program mentor providing advice about academic activities, scheduling and career plans. Fellowship Training: I have served as his primary mentor, providing advice about his scholarly and clinical activities and his career planning
Current Medical Career	Tyler is in his first year as a Clinical Instructor in the Division of General Internal Medicine, based at the Puget Sound Veterans Affairs Health Care System. He will attend on the medical wards and, on a limited basis, in the intensive care unit.
Joint Projects	None

Samuel Ash

Dates	2010-2013
Mentoring Roles	Residency Training: I served as his formal residency program mentor providing advice about academic activities, scheduling and career plans.
Current Medical Career	Sam is in his third year of Pulmonary and Critical Care Medicine Fellowship at Brigham and Women's Hospital in Boston.
Joint Projects	None

See next page for information about additional mentees

Robert Dickson

Dates	2008-2011
Mentoring Roles	Residency Training: I provided informal mentoring throughout his residency training and chief residency year including advising him with regard to some of his academic projects, career plans and his work as a chief resident.
Current Medical Career	Robert is an Assistant Professor in the division of Pulmonary and Critical Care Medicine at the University of Michigan
Joint Projects	<p>Dickson R, Luks AM. Toluene toxicity as a Cause of Elevated Anion Gap Metabolic Acidosis. <i>Respir Care</i>. 2009. 54(8): 1115-1117.</p> <p>Dickson R, Luks AM. A 65 year-old man with severe hyponatremia and alcohol abuse. <i>Chest</i>. 2010. 138(2): 445-447.</p>
Feedback	<p>At the end of his chief residency year, Robert wrote a letter to my division head in which he said the following: <i>“Andy has a reputation among residents as an accessible and resourceful mentor to residents interested in Pulmonary and Critical Care, and he is often a “first stop” before trainees find their academic mentor for research experiences. He provides thoughtful counsel to residents throughout the fellowship application process, and organizes a yearly information-sharing dinner for prospective applicants that is well-attended and well-received. He routinely serves as mentor for trainees interested in publishing case reports and on-line teaching modules, and has informally advised trainees interested in Clinician-Educator careers outside of Pulmonary and Critical Care. He is a reliable source of constructive feedback to Chief Residents regarding their educational sessions, and demonstrates a consistent and earnest passion for clinical education.”</i></p>

See next page for information about additional mentees

Gabriel Wallace

Dates	2010-2012
Mentoring Roles	Medical School: I served as Gabriel's formal mentor in the School of Medicine's Underserved Pathway providing advice about academic activities, clerkship scheduling and career plans.
Current Medical Career	Gabriel is in his fourth year of General Surgery residency at the University of Washington
Joint Projects	None

Kathryn Whitaker

Dates	2011-2013
Mentoring Roles	Medical School: Kathryn completed a preceptorship with me in the winter quarter of her second year of residency. Following that, I served as an informal mentor through the remainder of her medical school training. In addition to providing career advice, one of my key interventions was putting Kathryn in contact with Randall Curtis, a senior member of my division, who has since become her research mentor
Current Medical Career	Kathryn is in her third year of residency training in Internal Medicine at the University of Washington and is planning to apply for fellowship in Infectious Diseases. She is considering additional training in Critical Care Medicine at the conclusion of that fellowship
Joint Projects	None

4. Critical Care Medicine Fellowship Trainees

Through my role as Program Director of the Critical Care Medicine Fellowship I have mentored the following program trainees:

Trainee	Year(s) in Program	Outcome / Status
Mark Sullivan	2012-2013	Successfully completed the program; Accepted position with a private practice group in Seattle
Iyabo Tinubu-Karch	2013-2014	By mutual agreement, left the program before completing requirements for board eligibility
Nicholas Johnson	2014-Present	In the second of two planned years of training. Successfully meeting all training goals. Plans to stay in academic medicine
Patrick Maher	2015-Present	In the first of two planned years of training. Successfully meeting all training goals.

5. Preceptorships

Since 2011, I have served as a preceptor for 1-4 second year medical students per year (I precept up to 2 students during each of the winter and spring quarters). Each preceptee joins me for 8 sessions during which they work with me during morning rounds in the ICU. I begin each session with a 45-60 minute period of one-on-one teaching related to the patients we will see later that day on rounds. I have served as preceptor for the following students:

Student	Quarter
Kathryn Whitaker	Winter 2011
Kate Bayliss	Spring 2011
Natalie Hale	Autumn 2011
Kyle Hancock	Winter 2012
Maren Shipe	Winter 2012
Anne Gayman	Spring 2012
Adrianna Piazza	Spring 2012
Paul Lindau	Winter 2013
Tara Simpson	Winter 2013
Greta Tubbesing	Spring 2013
Ross Orpet	Winter 2014
Melanie Nelson	Winter 2015
Ida Wilson	Winter 2015

A sample of comments I received by email from some of the students with whom I have done preceptorships include the following:

"I wanted to drop you a quick line and thank you for the awesome experience this quarter. It was truly awesome precepting with you, and per unit time I learned more in our 8 sessions than any other experience in med school thus far. As I'm sure you are well aware, you are an excellent teacher, an impressively knowledgeable yet compassionate physician, and a somehow better person--I simply couldn't recommend you highly enough to anyone."

"It was the best preceptorship ever. I don't have a spot of feedback (and usually I'm quite verbose in that arena). You have been the best clinical teacher I've ever had. I appreciate your patience and thoroughness, and your somehow always knowing my level of knowledge and what I'm working on learning. I feel way more confident going into clerkships after just a few sessions with you, and way more excited for more clinical learning. I'm crossing my fingers to see you again in Year 3 or 4!"

"I just wanted to write and thank you for a great quarter. I learned a huge amount and greatly appreciated the opportunity to solidify much of the knowledge from this year in real-life cases. It was such a welcome change to actually spend some time working with patients instead of just sitting in a classroom all day! The dedicated teaching-time that you spent with me, both in larger groups and one on one was a completely invaluable part of this experience, and I now feel much more confident about my ability to excel during third year and beyond.... Thank you again for all of your time this quarter - your dedication to teaching and patient care is inspiring and an incredible asset to this program and my education."

"Thank you so much for one of the best experiences in med school (and undergrad for that matter) thus far. You are one of the best teachers I have ever had the privilege of learning from!! The preceptorship was not only tremendously educational but it was inspiring and fun!"

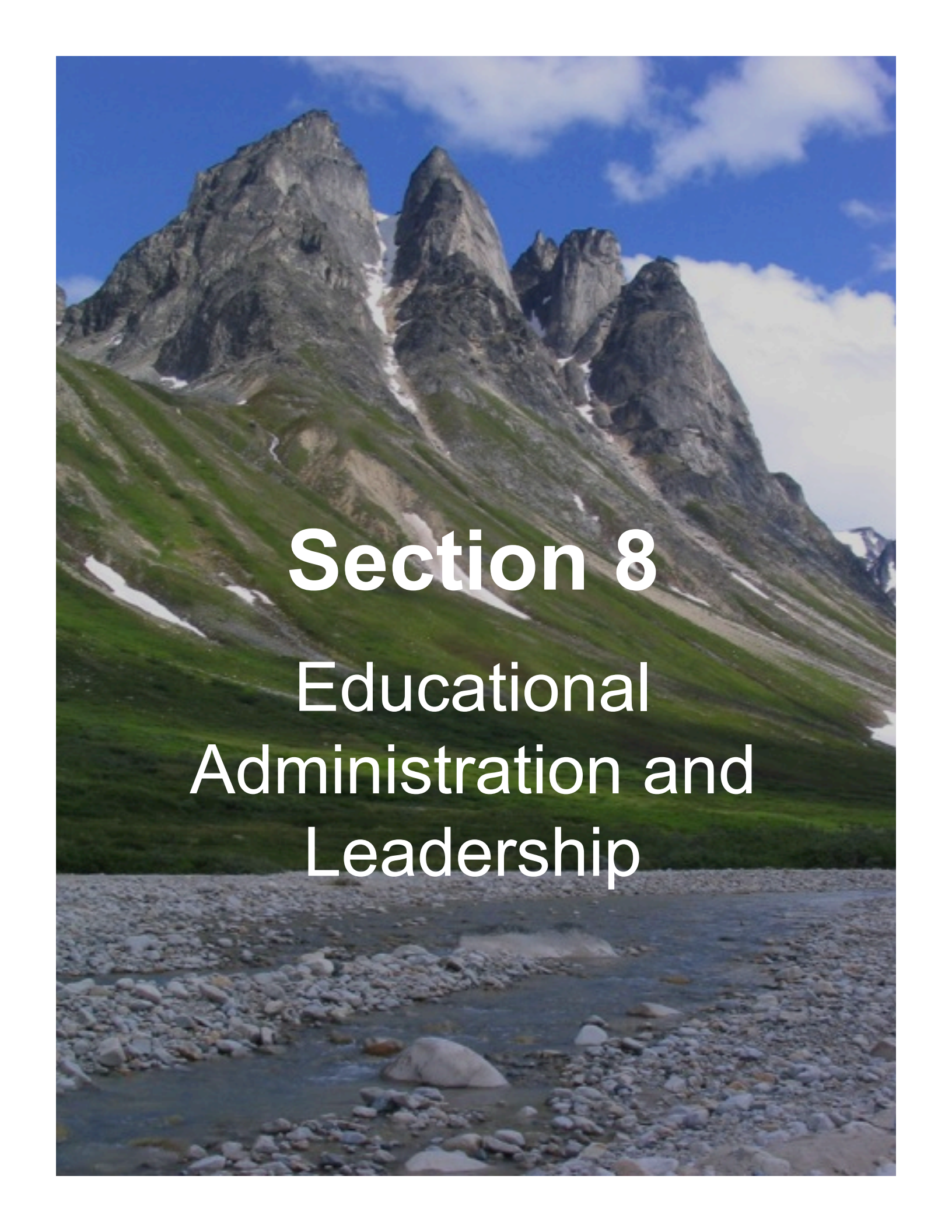
"I just wanted to express my gratitude for the opportunity to precept with you this quarter. It has relit my passion for critical care medicine and also reminded me of why I am doing all of this. Your teaching is unparalleled and I appreciate that it isn't too intimidating which allows us to learn more from you, the team and the patients. Thank you again for a wonderful experience."

Additional evaluation information and comments from the formal evaluations can be found in Section 4 of this teaching portfolio (Teaching Activities and Role as an Educator).

6. Mentored Writing Projects

I have mentored resident and fellow-level trainees through the following writing projects:

- Dickson R, Luks AM. Toluene toxicity as a Cause of Elevated Anion Gap Metabolic Acidosis. *Respir Care*. 2009. 54(8): 1115-1117.
- Dickson R, Luks AM. A 65 year-old man with severe hyponatremia and alcohol abuse. *Chest*. 2010. 138(2): 445-447.
- Goldman JD, Vollmer M, Luks AM. Teaching Case of the Month: Cryptococcosis in the Immunocompetent Patient. *Respir Care* 2010. 55(11): 1499-1503.
- Wemple M, Luks AM. Challenges Associated With Central Venous Catheter Placement and Central Venous Oxygen Saturation Monitoring. *Respir Care*. 2012. 57(12): 2119-2123.
- Simmons J, Luks AM. Tension Pneumocephalus: An Uncommon Cause of Altered Mental Status. *J Emerg Med*. 2013. 44(2): 340-343.
- Doan DB, Luks AM. Wilderness and Adventure Travel With Underlying Asthma. *Wilderness Environ Med*. 2014. 25(2): 231-240.
- Rossow CF, Luks AM. A 68 year-old Woman with Hoarseness and Upper Airway Edema. *Ann Am Thorac Soc* 2014. 11(4): 668-670.
- Çoruh B, Luks AM. Positive End-Expiratory Pressure: When More May Not Be Better. *Ann Am Thorac Soc* 2014. 11(8): 1327-1331.
- Steinbach TC, Luks AM. A 68 Year-Old Man With Acute Respiratory Failure and Hypotension. *Ann Am Thorac Soc* 2015. 12(4): 599-603.
- Johnson N, Luks AM. High-Altitude Medicine. *Medical Clinics of North America: Travel and Adventure Medicine*. Pottinger P and Sanford CA eds. Philadelphia: Elsevier. In Press

The background image is a photograph of a mountain range. In the foreground, there is a rocky riverbed with some water flowing through it. The middle ground shows steep, green slopes with patches of snow. The background features several sharp, rocky mountain peaks under a blue sky with scattered white clouds.

Section 8

Educational Administration and Leadership

Section 8: Educational Administration and Leadership

Leadership Roles

I have the following leadership roles at the University of Washington. Each of these activities has been described in greater detail in Section 4 of this portfolio, Teaching Activities and Role as an Educator.

School of Medicine

- **CPR: Block Chair.** This is one of the core blocks medical students will complete as part of the revised curriculum that is slated to make its debut in the fall of 2015. I am overseeing all aspects of curriculum development for this 10-week course, which will cover the physiology and pathophysiology of the cardiac, pulmonary and renal systems. In this role, I am responsible for coordinating the activities of co-block leaders in Seattle, as well as at each of the regional sites in the WWAMI region at which students will complete the course. I am also responsible for the entire pulmonary component of the course. To this point, we have created our course calendar, completed the course and session objectives, created our plan for assessments and organized our plan for delivering the course material in Seattle and at the regional sites. I am in the process of writing the course syllabus, devising small and large group materials and creating the assessments. I will also be responsible for developing and maintaining the course website and instituting a program of active learning in the classroom. The course will be delivered for the first time in the winter of 2016.
- **HuBio 541 The Respiratory System: Course Chair.** From 2009 until 2012, I served as Co-Course chair with Dr. Bruce Culver. In addition to my roles as a course lecturer and small group leader, I oversaw the course website including ensuring that all of the materials were up-to-date, ensuring that all schedules, lectures and syllabus materials were posted at the appropriate time and maintaining the course discussion board. I also began substantial revisions to the course syllabus and undertook major revisions to many of the small group session materials. I also held numerous office hours for the students throughout the course and served as the main facilitator of communication with the students about course activities, examinations etc. In 2013, I took over as the sole course chair. Knowing that the new curriculum was slated to begin within a few years, I opted to forego a major overhaul of the course outline and structure and focused on improving our current course materials. I finished a complete revision of the course syllabus and finished revision of the small group materials. I completely revised the course examinations, emphasizing questions based solely on the USMLE case-based format. I also instituted a program of faculty development for our small group leaders as well as a system for observing and providing feedback to group leaders for their work in those sessions. A more complete description of my roles in the course, including evaluation information, is provided in the Teaching Activities section of this portfolio.

- **Med 534 Wilderness Medicine: Course Chair.** I originally co-chaired this course with David Townes from the Division of Emergency Medicine but since 2009 have run the course by myself. I handle all aspects of the course organization including revising the curriculum each year, arranging speakers, organizing hands-on workshops, and creating and disseminating educational activities such as the Weekly Puzzle. I deliver several lectures and lead several small group sessions myself and also maintain the course website on Canvas. A fuller description of my role in this course, including evaluation information, is provided in the Teaching Activities section of this portfolio under “Curriculum Development.”
- **Med 536 Introduction to Critical Care Medicine: Co-Course Chair.** Along with Mary King from the Department of Pediatrics and Trish Kritek from the Department of Medicine, I have served as co-chair for this course, which has been offered annually since 2009 (Dr. Kritek joined the course leadership in 2011). As with Med 534, I handle all aspects of course organization including arranging speakers, organizing course workshops, creating and grading the course-take home assignment and organizing the in-person learning opportunities students are required to complete as part of the course. I also give several lectures and lead several bedside teaching sessions throughout the course. A fuller description of my role in this course, including scholarship that has been generated through this course and course evaluations, is provided in the Teaching Activities section of this portfolio under “Curriculum Development.”
- **Med 610 Fourth Year Clerkship in Pulmonary and Critical Care Medicine: Clerkship Director.** I held this role between 2008 and 2014. My primary responsibilities included overseeing various aspects of the clerkship including the student workflow at each of the sites, the weekly student seminar and the clerkship website. My two major accomplishments in this role included (1) a complete revision of the course website and (2) creation of a curriculum for the weekly student seminar. Prior to my assuming this role in 2008, the clerkship lacked a website. I created all of the material for a new site that housed a large amount of educational information that students access throughout their rotation. The site, which can be viewed at <http://courses.washington.edu/med610>, has been replaced by a new Canvas site that is largely based on the material I created. To address the lack of a formal curriculum for the weekly student seminars. I directed an effort of colleagues in my division to create a formal case-based curriculum with appropriate supporting materials. A fuller description of work as clerkship director, including scholarship that has been generated through this course, is described in the Teaching Activities section of this portfolio under “Curriculum Development.”
- **Med 620/621 Sub-internship in Critical Care Medicine: Clerkship Director.** As described in the Teaching Activities section of this portfolio under Curriculum Development, I created this rotation for fourth year medical students in 2009 and have served as the clerkship director since that time. After originally starting the rotation at Harborview Medical Center, I have since expanded the clerkship to include students at the University of Washington Medical Center and, most recently,

the VA Medical Center. In my role as clerkship director, I oversee the student workflow at each site and maintain the clerkship website and its educational materials, which can be viewed at <http://courses.washington.edu/med620>. I also hold weekly teaching sessions on core ICU topics to the students rotating at Harborview Medical Center and have instituted an orientation program at each site to ensure students are appropriately oriented to their site at the start of the rotation. A fuller description of work as clerkship director is described in the Teaching Activities section of this portfolio under “Curriculum Development.”

Division of Pulmonary and Critical Care Medicine

- **Critical Care Medicine Fellowship, Program Director.** 2012-Present. This program, which is the smaller of two fellowship programs run by the Division of Pulmonary and Critical Care Medicine, trains 1-2 fellows per year. I am responsible for directing the fellow selection process and managing the fellows’ progress through their training. Because the fellows in this program follow a clinical curriculum that is very similar to that of the fellows in the separate Pulmonary and Critical Care Medicine training program, I have not instituted major curricular revisions during this time and have worked to maintain good coordination between the two programs. I have also instituted a program of monthly mentoring meetings with the trainees that was not previously part of the training program’s approach.

Committee Memberships

I have participated in the following committees:

School of Medicine

- **Vice Dean For Academic Affairs Search Committee.** October 2010-April 2011. Chair: F. Bruder Stapleton. The primary task of this committee was to review applications for the Vice Dean for Academic Affairs position, invite and interview a select group of candidates from the applicant pool and then provide recommendations to Dean Ramsey regarding those candidates felt to be worthy of final consideration for the position.
- **Pre-Curriculum Review Committee.** October 2010-August 2011. Chairs: Suzanne Allen and Michael Ryan. The charge of this committee has been to (1) Identify, discuss and evaluate broad curricular strengths and areas for improvement, with particular attention to areas for improvement identified in the LCME self-study and report; (2) Consider important regional expansion and workforce issues; (3) Engage broadly with faculty, staff, students, and other relevant individuals and groups to assess their perspectives and suggestions concerning the School’s curricular strengths, areas for improvement, and possible expansion approaches; and (4) Develop a rationale, a set of guiding principles, and a proposed approach to a

curriculum review, including recommendations concerning the scope of the curriculum review.

- **Curriculum Renewal Patient Care Phase Committee. Co-chair.** 2012-2013. Along with Hugh Foy, from the Department of Surgery, I co-chaired this committee whose primary task was to provide recommendations regarding the timing, duration and content of the Patient Care Phase of the new School of Medicine curriculum.
- **Curriculum Renewal Patient Care Phase Committee.** 2013-2014. Chairs: Richard Veith, Mark Whipple. The primary task of this committee was to build on the work done by the prior Patient Care Phase Committee and provide further recommendations regarding the structure and content of the Patient Care Phase of the new School of Medicine curriculum.
- **Second Year Curriculum Committee.** October 2009-Present. Chair: Bruce Silverstein. By virtue of my position as co-chair of HuBio 541, The Respiratory System, I sit on this committee, which meets monthly during the academic year and provides input to the School of Medicine administration about various aspects of the second year curriculum.

Department of Medicine

- **Mentorship Committee.** 2014-Present. Chair: Ellen Schur. The committee's main roles have been to develop criteria for mentorship awards in the Department of Medicine and devise and disseminate guidelines for faculty mentorship within the Department.

Division of Pulmonary and Critical Care Medicine

- **Fellowship Selection Committee.** 2010-2012. Chair: Mark Tonelli. The primary role of this committee is to review the files of fellowship applicants, interview candidates and then determine the final rank list for the fellowship match process.
- **Clinician-Educator Working Group.** 2008-Present. Chair: Joshua Benditt. Comprised of the clinician-educators in the Division of Pulmonary and Critical Care Medicine, this group meets on a monthly basis to develop and oversee various educational projects within the division such as the weekly educational conference, a system for peer review of faculty and fellow lectures, a quarterly educational works in progress session and quarterly faculty development sessions.

National Committee Assignments

- **Wilderness Medical Society – Altitude Illness Guidelines Committee.** 2009.

Chair: Colin Grissom. I served as a member of this expert panel whose main task was to develop and write a set of guidelines for the prevention and treatment of acute altitude illness. I served as lead author for the initial set of guidelines published in 2010 and recently served as lead author and project manager for a revised set of guidelines published in 2014. The citation is: Luks AM, McIntosh SE, Grissom CK, Auerbach PS, Rodway GW, Schoene RB, Zafren K, Hackett PH. Wilderness Medical Society Consensus Guidelines for the Prevention and Treatment of Acute Altitude Illness: 2014 Update. Wilderness Environ Med 2014. 25(4S): S4-S14

- **American Thoracic Society Education Committee.** 2009-Present. Chair: Carey Thompson. This committee has responsibility for several education-related activities within the Society the most important of which are the annual review and selection of post-graduate seminars for the International Conference and oversight of the ACCME accreditation process.
- **American Thoracic Society Core Curriculum Series and Maintenance of Certification (MOC) Modules Program. Steering Committee.** MOC Developer and Editors Group for Pulmonary Core and Critical Care Core Symposia: The role of this committee is to create and maintain an annual Maintenance of Certification curriculum for attendees of the American Thoracic Society International Conference.

A full-page background image of a rugged mountain landscape. In the foreground, there are large, flat, grey rocks interspersed with patches of yellowish-brown and green low-lying vegetation. A small, calm lake is visible in the middle ground, reflecting the sky. The background is dominated by a massive, dark grey mountain with sharp, jagged peaks. Patches of white snow are nestled in the mountain's crevices, along its ridges, and on its upper slopes. The sky above is a deep blue, filled with wispy white clouds.

Section 9

Honors and Awards

Section 9: Teaching Honors and Awards

University of Washington School of Medicine Distinguished Teacher Award 2010, 2011, 2012, 2013



This award is given by the graduating students in the School of Medicine on an annual basis to two faculty members in recognition of outstanding basic science or clinical teaching. I received this award four consecutive years beginning in my third year as a faculty member and am the only person in my division to receive this honor.

Teacher Superior in Perpetuity 2013



By virtue of the fact that I received four Distinguished Teaching Awards, I was given the designation of "Teacher Superior in Perpetuity" and am no longer eligible to receive the Distinguished Teaching Award.

**University of Washington Margaret S. Anderson Award
2013**

This award is given annually by the graduating medical students to the faculty member who has shown great concern for and support of medical students.

**University of Washington School of Medicine Hooding Ceremony
Commencement Speaker
2013**



The commencement address is traditionally given by a School of Medicine faculty member selected by a vote of the graduating medical students.

**David R Saunders Memorial Award for Excellence in Teaching
2011-2012, 2013-2014, 2014-2015**

This award is given by the second year medical students in the School of Medicine to the individual they designate as the best teacher in the second year curriculum. I am the only member of my division to receive this honor.

Paul B. Beeson Award, 2009



This award is given on an annual basis by trainees in the Internal Medicine Residency Program to a faculty member within the Department of Internal Medicine in recognition of outstanding clinical teaching. I was selected by the residents to receive this award in my second year on faculty and was, at the time, the third member of my division to receive this honor.

Resident Excellence in Teaching Award, 2000-2001, 2001-2002, 2002-2003

This award is given by the Internal Medicine Residency Program on an annual basis to residents in recognition of outstanding student teaching. Nominations are solicited from the medical students and the winners are selected by the program leadership.

Alpha Omega Alpha Medical Honor Society, 2002

In 2002, I was nominated by students in the School of Medicine to join this honor society in recognition of my efforts on behalf of medical student education.

A photograph of a snow-capped mountain peak under a clear blue sky. The foreground shows dark, rocky terrain with patches of snow. The text "Section 10" and "Long-Term Goals" is overlaid in white.

Section 10

Long-Term Goals

Section 10: Long-Term Goals

I have developed several long-terms that can be separated into broad categories including plans for improving my courses and clerkships, plans for improving my skills as a teacher and plans for my scholarship and long-term career trajectory.

Plans for Improving My Courses and Clerkships

With the introduction of the new curriculum at the School of Medicine in the fall of 2015, my current respiratory physiology and pathophysiology course, HuBio 541, will be replaced by a new course called CPR. I have spent much of the past 5 years refining the material and delivery of HuBio 541 and raising the quality of the course to the point that it is now one of the most highly rated courses in the current second year curriculum. The new course is being created from scratch and will require several years of effort to achieve the goals I have in my mind for it. I am excited about this curriculum development opportunity and determined to bring it up to the standard of my current course and make it a model for the new curriculum.

Another course about which I care a lot is Medeck 620, the Subinternship in Critical Care Medicine that I started several years ago. While the rotation is highly rated and valued by students I think it can be better. Once I have time in my schedule after the rollout of the new curriculum, I want to do further work to improve the educational materials for the clerkship including creating a set of interactive on-line cases for students, improving the website and implementing a formal series of learning encounters (e.g., a weekly student seminar, simulation training) across all sites. Students are also doing ICU rotations at sites outside Seattle for which I have no oversight role, but I would like to reach out to these sites and create a more integrated arrangement in which students at all sites are expected to achieve the same learning objectives, are assessed according to the same criteria and have access to the same educational program.

Plans for Improving My Skills as a Teacher

Over the last several years, I have made progress integrating active learning techniques in my classroom but I think I can do better in this regard and want to continue building these skills. Despite my earlier goals of improving in the areas of providing effective feedback and dealing with difficult learners, I am still struggling in these areas and need to improve these skills as well. I hope to achieve these goals through attendance at faculty development seminars here in the School of Medicine and through my professional society and remain very interested in attending a program such as the Harvard Macy Institute Program for Educators. I have wanted to attend the latter for several years but time and funding constraints have limited my ability to do so.

Plans for My Scholarship

In addition to ongoing projects in the area of high altitude medicine and physiology, including a research study investigating attitudes and practices of Mt. Everest climbers regarding medication while climbing the mountain, I have several larger writing projects that I aim to complete in the next several years. First, having served as co-author for a revision of Respiratory Physiology: The Essentials by John West, I have been asked to

serve as co-author for a new edition of Pulmonary Pathophysiology: The Essentials, also authored by Dr. West. Second, I have always been somewhat disappointed with the lack of an adequate medical student-level textbook about intensive care unit medicine. One of my primary long-term goals is to fill this gap and create a textbook level resource that is appropriately pitched at the medical student level. Finally, I hope to do a revision of Introduction to Cardiopulmonary Exercise Testing that I co-authored with Drs. Glenny and Robertson in 2013.

Plans for My Long-Term Career Trajectory

While I anticipate continuing my direct teaching activities for a long-time to come, as they are something from which I derive tremendous satisfaction, I would also like to assume more of a leadership role in medical student education at the School of Medicine. Despite giving a lot of thought to this issue, I am still not sure exactly what such a role would look like but am interested in pursuing opportunities that would help others become better educators in the classroom and on the wards.

In addition to building my role within the School of Medicine, I also want to continue increasing my national presence as an educator in Pulmonary and Critical Care Medicine. I have made progress in this regard over the past several years through my ongoing work on the Education Committee of my professional society and through my leadership of an ongoing series of post-graduate seminars at the society's annual International Conference but I would like to expand beyond these venues and have an even greater presence. I recognize that I may never be known as an outstanding physiology researcher but want to get to the point where I'm seen as an outstanding physiology *educator* on the level of individuals like Richard Schwartzstein and John West.

One Final Goal

In 2013, I achieved one the major goals I set for myself at the start of my academic career when I was recognized as a Teacher Superior in Perpetuity. With that task accomplished, I am still hoping to some day shake the hand of the President of the University of Washington if I am fortunate to win one of the campus-wide Distinguished Teaching Awards.