Executive Summary: Longitudinal Clinical Curriculum Reform Committee

Charge: Review the current landscape of the CUSOM clinical curricula (MS1-MS4), including timing and structure. The committee should brainstorm about the most ideal structure and content for CUSOM.

Key Recommendations:

Phase 1 : Bedrock (pre-clerkship, 1 full year, primarily focused on foundational/basic science curriculum)

- Fundamental clinical skills taught in small stable groups of peers with consistent, dedicated faculty coaches/mentors.
- Groups established in Phase I, but persist throughout the 4-year curriculum providing continuity in a learning community.
- One full day per week dedicated to the clinical curriculum.
- Doctoring curriculum: Physical exam, clinical reasoning, communication, ethics, humanities, PBL (or similar), ACP (or similar).
- Clinical preceptorships: Group of students assigned to a clinical site instead of individual preceptors. Students work with preceptors and participate in QI projects, interact with members of the inter-professional team, and complete curriculum in system science at their site.

Phase 2: Front Range (clerkship, 10 months)

- All clerkship programs will meet fundamental requirements of ***continuity and individualization***.
- After extensive discussion and review of the literature and best practices, this committee concluded that conversion to all Longitudinal Integrated Clerkships is our recommendation.
- Students will participate in a match in Phase 1 to place into 1 of 18 LIC programs.
- Each LIC will foster a small (10 students) learning community and individual curricular focus.
- Cluster groups of LICs within hospital systems; thematic directors will oversee specialized content that LIC programs have in common between clusters.
- Students will sit for USMLE Step 2 and 1 (in that order) after completion of Phase 2.

Phase 3/4: Backcountry (post-clerkship, 22 months, a space for integration of curricular elements beyond the scope of this committee: ie. humanism, curiosity, service learning)

- Elective small group experiences with dynamic student-centered formats (i.e. interactive TBL/PBL or laboratory experiences) aimed at integrating principles of foundational and social science introduced in Bedrock (Phase I) and Front Range (Phase II).
- Elective clinical rotations in non-core clinical fields and specialties
- Students return to their clinical site from Phase I to serve as leaders of QI teams and peer mentors for first year students.
- Students designate a longitudinal clinical preceptor to continue weekly sessions with.
- Acting internships, externships, advanced residency preparation/boot camps, ERAS, interviews.

Potential outcomes/competencies that could be used to measure success of innovation:

- General medical knowledge needed for the practice of medicine
- Clinical skills needed to begin Clerkships and/or intern year
- Empathic, service-oriented, patient-centered physicians who are prepared to be leaders
- Proficiency in team-based care
- Skills for lifelong learning in medicine and Engagement in individualized learning
- Establishment of longitudinal relationships with patients and families
- Retention of excellent clinical faculty
- Minimization of experiences of gender, sexual orientation, and racial bias
- Learning environment that reflects patient centered care and facilitates learning
- Minimization/reduction of student mistreatment and student burnout

Longitudinal Clinical Curriculum Reform Committee

Co-Chairs:

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Purpose of the committee

This committee was charged with reviewing the current landscape of the CUSOM clinical curricula (MS1-MS4), including timing and structure. Examples such as LIC, continuous clinical rotations starting in year 1 and hybrid models should be considered. The committee should brainstorm in a "blue sky" fashion about the most ideal structure and content for CUSOM.

Longitudinal Clinical Curriculum Reform Committee Key Themes and Principles

Continuity as an organizing principle for the clinical curriculum:

- Continuity with patients leading to patient-centeredness and authentic roles in patient care.
- Continuity with faculty in clinical training leading to improved feedback, mentorship, coaching and role modeling for students. This allows more accurately assess clinical competence and increased faculty engagement with the curriculum as well as satisfaction related to longitudinal relationships with students.
- Continuity with health care setting, system, and community leading to a deeper understanding of health care systems and minimization of wasted curricular time related to orientation.
- Continuity with peers leading to mutual support, peer learning and enhanced wellness.
- Longitudinal models of training to help to achieve goals important to the CUSOM such as decreased mistreatment, improved faculty professionalism, and improved student wellness in addition to well-documented outcomes related to student achievement.
- Longitudinal cohorts of students and faculty throughout 4 years of medical school.
- Continued emphasis in the pre-clerkship phase on clinical skills and patient care.
- Longitudinal coaches/advisors without evaluative roles to review and facilitate student progress holistically, help set goals, and identify remediation needs if applicable.
- Longitudinal placements allow students to participate meaningfully in project/scholarly work

Individualization of clinical education by allowing students to choose a learning program that best fits their needs, goals and preferences:

- Students can select a clerkship (LIC) and health care system/site with curricular area of focus that matches their interests.
- Opportunities for mentorship, role modeling, career pipelines, and scholarly project development in clinical setting with faculty who share similar interests.
- Post-clerkship time takes on particular importance in allowing students to integrate foundational material with advanced clinical science in a manner that is specific to their specialty of choice. The post-clerkship time also provides an opportunity for targeted exploration of specialty choices for students who need time to address questions about their options.

Review of best practices or alternative practices

Methods

In December of 2017, the committee chairs developed a list of medical schools that had undergone recent curricular reform or had developed innovative programs, especially focusing on longitudinal clinical experiences. Between the first and second LCC committee meetings, each committee member was asked to research two programs from that master list and a third "bonus" program of their own interest or discovered in their own research to ensure the review's broad scope. Reports on each school included a description of the school's curriculum, with a focus on novel areas related to longitudinal clinical experiences and when possible associated outcomes. All reports included references identifying data sources (often from school websites and sometimes from PubMed listed publications). The 42 reviews were assembled in a shared document that all committee members could access. At the second LCC committee meeting, data collected on each school was presented in small group breakouts, where LCC committee members worked to identify themes, best practices, and promising ideas (e.g., authentic roles with patients, increased emphasis in the pre-clerkship phase on clinical skills and patient care, continuity with setting/system and community, etc.). In a large group report-out, important themes were presented and resulted in the committee's list of key themes and principles listed above. Additionally, ten schools were identified for a more in-depth review, including communication with key contacts at those institutions when possible. These data were presented at the third committee meeting. Then four sub-committees, pre-clerkship phase, clerkship phase, post-clerkship phase and longitudinal, were created and charged with collating and utilizing the collected data relevant to their associated phase to brainstorm ideas about ideal curricula for the CUSOM. Using these collected themes and exemplars for guidance and inspiration, subcommittees developed and refined within-phase curricular reform proposals that were then iteratively reviewed and modified by the full committee.

Best and Alternative Practices:

Pre-clerkship: foundational clinical training, preceptorships and longitudinal clinical programs

Background literature summary:

Beginning with the initial survey of 41 programs, the pre-clerkship working group focused on the curricula of 6 schools, including the CU SOM. The core of the report was shaped from the examination of the publicly available resources published online by the above schools. Investigations of the curricular maps and details of their pre-clerkship phase were integrated with information acquired from dialogues with individual students and faculty at the various institutions. An examination of available peer reviewed literature did not reveal informative data useful in shaping the concepts and directions of the working group. Great consideration was given to current CU SOM programs and frameworks when designing the recommendations contained within this report. Specific aspects of the 5 programs examined with their pre-clerkship phase durations, are described below:

Major Curricular Elements Identified:

1. Early Clinical Exposure:
   Early clinical exposure is a fundamental element of all the programs examined similar to the preceptorship program within the FDC curriculum at CUSOM. Early introduction of clinical exposure into the pre-clerkship curriculum forms a basis on which students can safety practice doctoring skills while also building longitudinal relationships with clinical coaches, peers,

patients, and a healthcare system. Typically, at least 0.5 half days a week of protected time is allotted for learners to be at their clinical setting or participating in simulations.

2. Integrated Inter-Professional Education
   Early introduction and a strong emphasis on inter-professional education (IPE) are evident in all the programs examined, as well as in the current CUSOM curriculum. Several of the schools have integrated their IPE programs into clinical sites, allowing multiple healthcare professionals to develop team skills outside the classroom. In this model, learners from all disciplines develop teamwork and clinical skills necessary to the care of patients. Learners are then able to form longitudinal relationships with both allied professionals and patients while learning systems science through active participation in quality improvement projects.
3. Coach and Peer Cohort Groups
   Though this arrangement is not novel and is currently practiced at CUSOM by way of the ACP coaching, PBL groups and to some extent physical exam and communication skills groups, many schools have expanded the roles of education facilitators or coaches. Various schools utilize an ACP-like system to assign students to a faculty coach and integrate doctoring curriculum, ethics, professional identity development and clinical experiences. In these models, the coach serves not only as a point of contact for students in times of need or for career advising, but act as a hub of their education in learning to care for patients and navigation of ever more complicated health care systems.
4. Longitudinal Doctoring Curriculum
   All schools examined utilize a doctoring curriculum that begins early in pre-clinical training and continues through the clinical phase, if not the entire four years of school. Doctoring skills are taught by a combination of experts, standardized patients, and with clinician coaches. Similar to the CUSOM, the founding principles of doctoring are history taking, communication, physical exam, clinical reasoning, and diagnostic skills; inter-professional education; and professional development and reflection.
5. Shortened Pre-Clinical Duration
   An obvious trend in medical education is the shortened duration of the pre-clerkship phase (Emanuel, 2017). In light of medical knowledge changing rapidly and continuing to grow, the schools address the need for specialized study by allowing time for study of foundational sciences following the clerkship experiences.

Summary of best practices nationally:

1. Harvard University: Students take a longitudinal clinical skills program called Practice of Medicine throughout their first year, similar to Foundations of Doctoring but with additional curricular components. Skills learned: interview and communication; physical examination, clinical reasoning, and diagnostic skills; ambulatory and inter-professional education; and professional development and reflection. This is guided by faculty at a clinical site where students will ultimately do clerkship rotations. Students have weekly sessions that alternate between inpatient and outpatient settings.
2. University of Michigan: A group of 10-12 students is paired with a physician coach for a "Doctoring" course for all four years. This coach is part of their M-home (like advisory colleges), and doesn't formally evaluate the student. With this coach, they learn how to conduct histories and physicals on real patients in hospitals and clinics, and interact with patient volunteers and families coping with chronic illness. In addition, students work with standardized patients to practice communication and clinical exam skills. They also discuss bias, ethical cases, socio-

behavioral components of health, and other topics with the coach and small group. These groups meet throughout all four years.

3. Vanderbilt: Vanderbilt's clinical curriculum begins year one with longitudinal clinical based learning on a 0.5 day/week basis.
4. UCSF Bridges Curriculum: in the Clinical Microsystems Clerkship a longitudinal program introduces how healthcare delivery impacts patient care and clinical outcomes by placing students on health systems improvement teams with meaningful roles and learning direct patient care in simulation labs and in clinic setting.
5. Yale University: Students learn the history and physical in the first 12 months as part of the Inter-professional Longitudinal Clinical Experience (ILCE). Small groups of interprofessional students learn the history and physical in clinical settings, with faculty from medicine, physician assistant, and nurse practitioner programs leading these learning experiences. Additional interprofessional learning occurs in large groups during this time. The clinical skills course continues for another 6 months, with medical students refining their clinical skills and the essential elements of "doctoring" in preparation for clerkships. Students learn to communicate with patients, families, and other members of the care team; examine patients; develop clinical reasoning skills; and understand the important role of a student-doctor in a patient's care. The experiences are designed to be hands-on, offering students the opportunity to develop clinical skills with direct faculty observation and feedback, frequently with the use of standardized patients. Emphasis is placed on taking a patient-centered approach to care. Attendance is mandatory and students must perform a competent history and physical exam in a standardized assessment session.
6. Medical College of Wisconsin (MCW) has 3 campuses, 2 of which are 3 year medical schools. In preclinical years the longitudinal experience on all of the campuses appears to be similar, but more time intensive, to CUSOM FDC. They call the experience 'clinical apprenticeship'. Students have a half day in a clinic every week during the first year of school.

Clerkships: principal clinical year

Background literature summary:

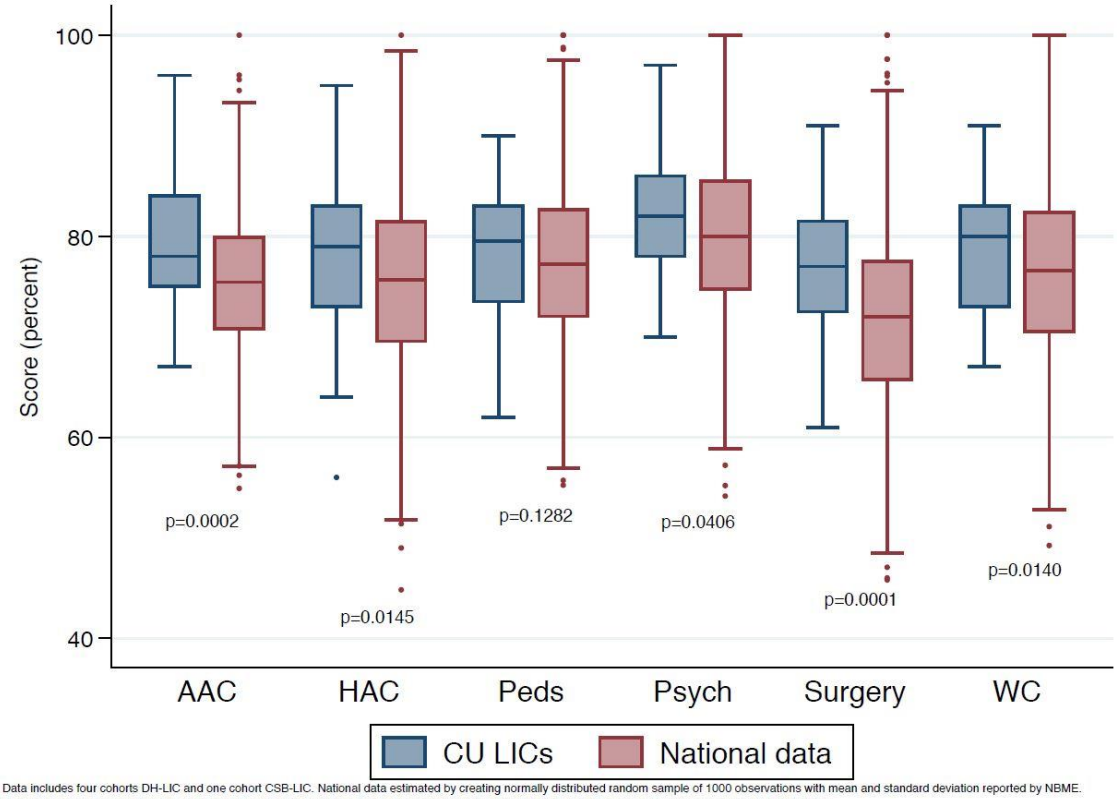
For much of the 20th century, clinical education for 3rd year medical students occurred through the traditional clerkship-based model. This traditional model leads to frequent changes in care settings and often prevents students from developing longitudinal relationships with patients, peers, faculty and staff within a healthcare system. Not surprisingly, students in traditional clerkship models report numerous challenges related to lack of continuity including unclear roles, inadequately defined responsibilities, and difficulties adjusting to frequent changes in healthcare systems and faculty (O'Brien et al. 2007). In response to these challenges, calls for educational reform have led to numerous innovative models for clinical clerkships centered on the organizing principle of continuity (Hirsch et al. 2007). Recognition of the numerous benefits outlined below for students, as well as improved engagement and satisfaction among faculty, has led to a rapid expansion of the longitudinal clerkship model across US medical schools (Mazotti et al. 2018, Norris et al. 2009, Strasser at al. 2011).

Longitudinal Integrated Clerkships (LICs) are teaching models in which students participate in comprehensive care of patients over time, engage in continuity relationships with clinical faculty known as preceptors, and meet core clinical competencies across multiple disciplines simultaneously (Worley et al. 2006, CLIC 2011). LICs have been shown to enhance students' educational experiences and result in improved measures of patient-centeredness and empathy (Ogur et al. 2007, Hirsh et al. 2012, Gaufberg et al. 2014) with equal or better performance on standardized exams, clinical assessments, sub-

internships, and national board examinations when compared to rotation based clerkships (Walters et al. 2012, Teherani et al. 2013). Students in LICs report greater satisfaction with clinical training than their peers in traditional clerkship models (Teherani et al. 2013). Faculty preceptors teaching in the LIC model report higher levels of satisfaction related to teaching medical students, less impact on time efficiency and productivity and high retention rates (Snow et al, 2017).

The **University of Colorado** has gained experience implementing several different models of longitudinal clerkships with great success. The rural Integrated Longitudinal Medicine Clerkship (ILMC) was implemented in 2011, Denver Health LIC was implemented in 2014, The VA Sequential Training (VAST) Program was implemented in 2015, and the Colorado Spring Branch LIC (COSMIC) LIC was implemented in 2016. Outcomes from the programs mirror or exceed what has been reported nationally. Extensive data are available, several examples of important outcomes are presented here:

Academically, students have performed extremely well in the LIC model as demonstrated by comparative shelf exam score in clerkships and USMLE Step 1 and 2 scores:



Data includes four cohorts DH-LIC and one cohort CSB-LIC. National data estimated by creating normally distributed random sample of 1000 observations with mean and standard deviation reported by NBME. Boxes indicate interquartile range. Vertical line inside box denotes median. Whiskers denote adjacent values. P-values generated with two-sided student's t-test.

All Years – Averages on 1st Sit by Exam and Program

PROGRAM	STEP 1*		STEP 2CK		STEP 2CS
	N	Average	N	Average	
BLOCKS-PASS	728	231.93	485	243.94	541
BLOCKS-FAIL	37	177.95	21	195.67	15
CSB-PASS	39	230.9	18	249.28	18
CSB -FAIL	0		0		1
DH-LIC-PASS	13	232.15	14	250.36	14
DH-LIC -FAIL	0		0		0
ILMC-PASS	17	228.41	29	244.14	28
ILMC -FAIL	0		1	203.00	0
VAST-PASS	11	235.36	11	250.55	11
VAST -FAIL	0		0		0

*2014-2018

Students rate the quality of teaching, feedback and role modeling from longitudinal preceptors very highly as demonstrated by data from the DH-LIC.

TEACHING QUALITY (scale 1-5) AY 2017-18 (class of 2018)	Mean DHLIC
Overall, attending faculty members were adequately involved in teaching the block.	5.0
I view my preceptors as role models of patient care that I hope to emulate in the future.	5.0
My preceptors regularly engaged in direct observation of my clinical care of patients.	4.57
I received useful feedback on my performance from my preceptors throughout the year.	4.71

Students are highly satisfied with their training in the longitudinal models. Interest vastly exceeds available opportunities for students in the longitudinal clerkships available at CU. For the class of 2021, 42 students applied for 10 spots in the DHLIC program and 16 students applied for 12 spots in the VAST program. Of the 284 students who were given acceptance to CUSOM from the Class of 2022, 27 students (9.5%) expressed a primary preference to be assigned to one of the 24 spots in the CSB LIC program compared with 20 students with a primary interest from the Class of 2021. For the Class of 22, another 33 accepted students (11.6%) expressed a preference for the Anschutz Medical Campus but a willingness to be assigned to the CSB LIC program.

Students are asked to rate the quality of the clerkship as a whole.

	CSB mean	VAST mean	DH LIC mean
What was the quality of the clerkship as a whole? (scale 1-5)	AY 16-17 AY 17-18	AY 15-16 (N=6) AY 16-17 (N=6)	AY 14-15 (N=8) AY 15-16 (N=8) AY 16-17 (N=8) AY 17-18 (N=8)
	4.08	4.84	5.0

One of the most important reasons to consider longitudinal clerkships relates to the depth and volume of student assessment. Longitudinal preceptors have been able to provide extremely in-depth descriptions of student performance in the LIC programs at CU. As the SOM considers moving towards a competency based evaluation system, this type of robust supervision, observation and documentation of clinical skills is mandatory for accurate assessment of competency. Furthermore, students have found the longitudinal relationships with faculty to support very robust letters of recommendation and meaningful mentorship.

Summary of best practices nationally and internationally:

Florida Atlantic University – An all LIC school of 64 students
South Dakota – original LIC in US at Yankton (30+ years of experience), recent expansion to all LIC
UCSF – (EPAC, VALOR, PISCES, Model SFGH, KLIC, Fresno) – multiples different longitudinal models with match system for students
U Washington – Twenty five percent of students (approximately 60 each class) participate in the WWAMI State Track Program and/or WRITE (WWAMI Rural Integrated Training Experience). The State Track Program allows select students to complete most of their required clerkships scheduled in one specific city or state throughout the WWAMI (Washington, Wyoming, Alaska, Montana, Idaho) region. The WRITE program provides an 18-22 week rural LIC to select students. UW has been doing remote clerkships for more than 40 years over the massive WWAMI region that encompasses over 1 million square miles. (Colorado has ~100,000 square miles)
University of North Carolina – A variety of tracks available to students, including some who do all LIC model. Students in the all LIC model outperform their peers on step 2 CK and shelf exams and choose primary care more often. All tracks do at least a 16 week block that is longitudinal.
Harvard – Year long LIC at Cambridge hospital, one of the pioneer schools for LICs. Results show equivalent academic outcomes, superior empathy/patient-centeredness, superior student satisfaction with learning environment, benefits of continuity with faculty/patients/institution.
University of Minnesota – Rural LIC program takes 30-40 students/year. Increased number of students choosing primary care and rural practice
Duke Primary Care LIC – 6 LIC students chosen/year
University of British Columbia rural LIC – A portion of students join a rural LIC program which splits students amongst 6 different rural sites. Students spend majority of time with Family Medicine preceptors achieving all core competencies.
UNLV – An all LIC school of 60 students
Kaiser Permanente –Developing an all LIC school

Imperial College, London – massive all LIC school (280 students) modeled after Cambridge program.
University of Minnesota Rural Physician Associate Program – A 9 month rural longitudinal clerkship program houses about 40 students, multiple small LIC options in urban academic center
Central Michigan University – Each student in their class of 104 will complete a 6 month LIC program

Post-Clerkship: advanced clinical training, individualized for specialty path

Background literature summary:

From the initial global review of medical school curricula, six schools were selected for an in-depth review of their post-clerkship curricula. Themes that stood to our group across institutions in the post-clerkship phase were: formalized residency preparation, time for career exploration, reintegration of the basic sciences, and longitudinal relationships with faculty members and patients. In a review of the literature, the most well studied area of post-clerkship curriculum was the idea of formalized residency preparation or "boot camps". Several authors have reported an increase in either student knowledge or subjective confidence regarding specific intern level tasks (Burns, 2016; Helen, 2017)

Summary of best practices nationally:

1. UCSF: Career launch boot camps, ambulatory capstone event
2. Penn State: mandatory residency prep course
3. Uniformed Services University: bench to bedside to integration basic science with clinical
4. Michigan: branches, 2 years of individualized emphasis on basic science and scholarly projects
5. Harvard Medical School and Vanderbilt: capstones, advisor directed

Several curricular elements and themes were identified including:
Individualization. Several marquee programs have built individualization into the post core-clinical phase (as well as the core clinical phases). These have taken several analogous forms and names including branches and pathways. They involve a deeper clinical experience in areas of interest to the student (planned career/residency paths). The clinical pathways have included discovery of advanced clinical fields (ENT, radiation oncology, etc.) or advanced elements of clinical medicine (value-based care, systems delivery, etc.)
Boot Camps. Gaining publicity in the medical education literature and the term has significant appeal to students and educators. Unfortunately, there is no common agreed upon definition for “boot camp.” Variable definitions based on review include: brief session focused on rapidly obtaining new medical knowledge or skills or reviewing them prior to the next phase of training. They are sometimes referred to as preparatory courses due to their focus on residency preparation. The new knowledge or skills are usually tied to Entrustable Professional Activities (EPAs).
Reintegration of foundational sciences. Although this is not specifically a clinical curricular element, special attention was made to programs that have attempted a true integration of foundational sciences into the clinical and post-core clinical phases.
Capstone events. These curricular elements represent the culmination of more longitudinal curricular elements. They vary in length to single day presentations to whole courses focused on the advanced review or completion of scholarly projects. We expect this element of the curriculum to be driven primarily by other sub-committees (ie. curiosity).

Current Assets of CUSOM curriculum: These are elements of the clinical curriculum that currently address the purpose and should be maintained

Foundations of Doctoring Curriculum:

- Program of early clinical exposures already in place
- PE and Communications curriculums are robust
- Longitudinal experience with peers provides comfort in training and facilitates training in how to provide peer-to-peer feedback
- Preceptorship provides valuable practice in the clinical setting
- Communications has an excellent model of coach-coaching (see appendix)

Problem-Based Learning Groups

- Peer group from Advisory College Program colleges provides supportive learning environment
- Robust structure with case-based learning to address both systems science and clinical reasoning

Tracks (perhaps in a modified form or with modified goals):

- Lots of variability in tracks
- Provide longitudinal clinical or academic experiences specific to career goals – individualization of education
- An important outcome may have related to meeting workforce needs: Rural specifically has funding and outcomes related to this

Longitudinal Clerkships:

- LICs developed and thriving with strong institutional support and high level of student interest at DH, VA and CSB
- Large number of skilled and dedicated faculty at clinical sites who have taught for years in RBC and need to remain engaged in curriculum reform/new clinical teaching models. Literature from local LIC program demonstrates higher level of engagement and retention of faculty in LIC vs RBC model.
- Rural sites that are ripe for expanding LIC models to encompass more specialties

Clinical Training Sites:

- CUSOM has large contingent of committed and skilled medical educators teaching in block clerkships at diverse training sites in metro Denver and in rural Colorado
- Existing relationships with faculty and hospitals/clinical sites

Integrated Clinicians Course:

- There are many aspects of the ICC that can be perceived to serve the purposes of a “boot camp”
- ICC has been responsive to student requests for decreased didactic time, increase in small group & experiential learning, providing a variety of optional sessions, and specialized offerings based on students’ declared specialty in the form of “tracks”

Boot Camp style electives in 4th year such as the Critical Care and Procedures Elective:

- Highly over-subscribed by students
- Replicated in small-scale boot camps for surgical bound students, and explored for OB/GYN bound students
- Barriers to broadening reach are faculty time, scheduling complexities, cost

CAPE (Center for Advancing Professional Excellence)

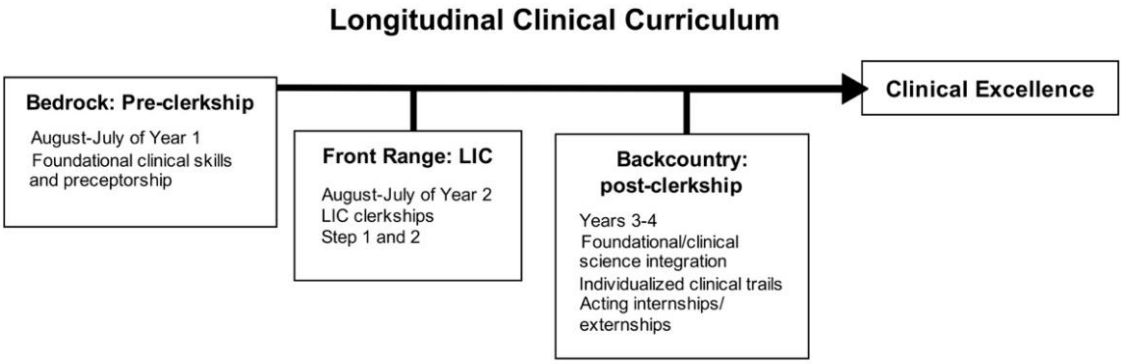
- 18,000 square foot facility, 15 examination rooms, 3 consult rooms, and 4 high-fidelity simulation suites
- highly trained standardized patients, standardized physical examination teaching associates, and communication remediation teams

- utilized several times throughout the curriculum including in FDC, ICC, CPE, IPED, and some clerkships and electives
- barriers to use includes cost & student scheduling issues
- potential future roles may include earlier exposure to clinical care in controlled/safe environment, introduction of advanced clinical skills, uniform student exposure to core curricular elements, assessment of core competencies, and provision of a platform for coaching/remediation
- data from CAPE encounters can be used for curriculum assessment and lead to modification

ACP (Advisory College Program)

- Focus on advising, peer and near-peer support, wellness
- The ACP can provide a framework that can be modified and enhanced as part of our new curriculum

Recommendations



Phase I: Bedrock

The majority of time in the Pre-Clerkship phase will be devoted to foundational (basic) science which is beyond the scope of this committee. The recommendations that follow speak specifically to clinical content in this phase.

The Foundations of Doctoring Course (FDC) is recognized as a particular area of strength in the current SOM curriculum. However, there are some deficiencies and challenges in the current program that this proposal seeks to address; and new opportunities that will be created in the proposed reformed clinical curriculum. Therefore, we propose the clinical curriculum in the pre-clerkship phase continue to be taught in the FDC structure with modifications, expanded content and additional resources as described below:

In Phase I, the components of the clinical curriculum will address:

- History and Physical Exam
- Communications
- Patient and Family Centered Care
- Clinical Reasoning
- Early Career Advising

We also anticipate Foundations would be a possible home for content being developed by other reform committees including:

- Inter-professional Development
- Systems Science
- Humanities
- Ethics

In later phases, these groups will grow to also encompass advanced clinical training (described in detail in the Phase III/IV Backcountry section of this report):

- Specialized pathophysiology physical exam sessions
- Documentation and Oral Presentation
- Later Career Advising

- Hidden Curriculum

Key elements:

- Fundamental clinical skills taught in small stable groups of peers with consistent, dedicated faculty coaches/mentors. We acknowledge that the structure of PBL, advisory colleges, IPE, ethics, humanities, system science, etc. may change depending on recommendations of other committees
- These groups will be established in Phase I, but will persist throughout the 4-year curriculum providing continuity with peers and faculty in a learning community with evolving goals as students progress in training.
- Faculty will have dedicated time, be highly trained, and selected for their skill in teaching, commitment to students, and ability to mentor and coach across the continuum of 4 years of medical school. (recommend working with reform committee on faculty development)

Time required:

- One full day per week is felt to be the minimum that would allow students to be adequately prepared for clinical work in Year 2 and is roughly equivalent to the half day per week spread over 2 years in the current FDC pre-clerkship curriculum.
- On alternating weeks half of student groups would be in small groups on campus participating in Doctoring Curriculum; half of groups would go to a clinical site (or sites if single site unable to accommodate entire group) together.
- The class would be split in 2, decreasing by half the number of coaches and clinical site potentially required.

This just serves as a model to demonstrate the importance of small cohorts of students that develop in 1st year and maintain continuity with each other and with faculty throughout their 4 years.

	Single student community	
	Doctoring facilitators	**Clinical community /preceptor**
Pre-clerkship: bedrock (alternate weeks)	PE, clinical reasoning, communication, ethics, humanities, PBL (or similar as determined by basic science), ACP (or similar) ##	Site: IPE, systems science, patient centered care, QI
Clerkship: front range	PE, communication, ethics, humanities, Hidden curriculum	N/A: students work with preceptors within LIC
Post-Clerkship: backcountry (alternate weeks)	^^PBL (foundational/clinical integration) Hidden curriculum, ACP	Site**: IPE, system science, patient centered care, QI, leadership

faculty continuity will be maintained as much as possible with some rotating faculty as needed depending on areas of expertise

**students in backcountry will rotate back to clinical community site and serve as peer coaches/leaders in projects working with bedrock students

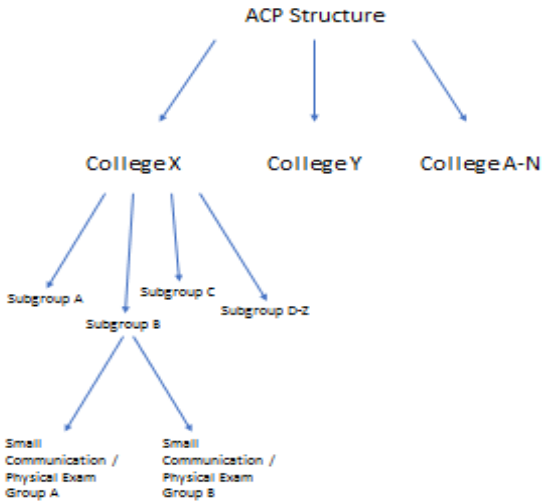
**students in backcountry will also maintain a longitudinal clinical preceptor from the front range – can choose a preceptor from their LIC program or a preceptor in their specialty of choice

^^in addition to the longitudinal faculty coaches, in the backcountry students will need specialty specific advisors to be identified

FDC Foundational Coaching (Clinician Facilitator/Coach) Recommendations:

The existing ACP structure can be modified and enhanced to frame small groups for teaching clinical skills and related humanities/ethics/reflection and other content. We recommend dividing the student body into equally sized sections of 24-48 medical students (Colleges). These groups can be broken down further into groups of 8-10 (Subgroups); clinical learning/PBL will take place in these smaller groups. These groups of 8-10 could be broken into groups of 4-5 for smaller sessions as needed (PE, clinical sites, etc).

Each group may have multiple mentors assigned to each cohort of 8-10, filling different roles, while maintaining longitudinality of peer relationships within both larger and smaller groups, and longitudinality of teacher/learner groups when possible. One model to consider is having one mentor to assist with the skills that are or will be formally graded/assessed, and another that facilitates small group learning and offers feedback (formative assessment) but not formal grading or evaluative judgments (summative assessment) for the students and can work to help the students build skills in areas that are not formally graded.



There must be an emphasis on choosing clinicians and coaches from diverse backgrounds to further meet the goals or our institution to promote faculty from diverse backgrounds and to provide our students with diverse perspectives and experiences.

We also recommend involving content experts to advise and teach the students. These experts would include SPETAS, and experts in communication, humanities, ethics, and other content areas that relate to clinical skills. (These activities should be coordinated with other curriculum reform committees.) These experts would also be crucial in serving as coach-coaches to ensure that master clinicians are teaching the students using consistent models and that we are constantly striving for excellence in teaching. Advanced students (MS4 students and advanced students in nursing, PT, PA, public health, etc.) can also play a role in preparing our students to perform clinical skills.

Mentors/clinicians need not be physicians, but faculty with the skills needed for teaching the curricular content and openness to faculty development. They would be chosen for their interpersonal skills and

ability to lead and effectively teach students. They would receive extensive faculty development to equip them to best meet these goals.

FDC Clinical Community Group (Primary Care Clinical Site)

- Components: Inter-professional Development, Systems Science, Patient-Centered Care, Clinical skills
- Same student group (or sub-group) as Doctoring
- Group of students assigned to a clinical site instead of a preceptor (depending on size of site, may be entire FDC group at a single site, or FDC group broken out into several smaller sites
- Individual students would alternate spending time with preceptor/s practicing clinical skills and working on a longitudinal QI project (co-mentored by on-site faculty and FDC coach), exploring experiences with all members of the inter-professional care team, completing curriculum/projects in system science. Students in 3rd and 4th year will return to this site to serve as team leaders and peer coaches.
- Ethics, Systems Science curriculum TBD by collaboration with ethics and policy reform committees
- Goals: Reduce preceptor variability, increase primary care exposure, and limit clinical sites by alternating student groups, create opportunity to follow patients longitudinally

Potential challenges:

- Limited primary care sites requiring recruitment and incentives, and would be asking sites to host multiple students
- Requires significant investment from entire care team and all the professionals involved, however students would be making significant contribution to QI efforts and navigation for patients. Based on LIC experience and experiences reported from institutions like Penn State, students can provide significant value in this type of model.

PBL Groups (Peer group from ACP College with Clinical Facilitator)

- Components: Clinical Reasoning
- Content TBD by Basic Science Reform Committee
- Importance of the PBL facilitator in the clinical curriculum will increase in Phase III (backcountry) with reintegration of basic science.

Phase II: Clerkships - Front Range

September – June (year 2, 10 months)

Process to select into clerkship programs in occurs mid-year in Phase I – students will enroll in a **match-like selection process**

- January: clerkship program presentations and opportunity fair
- February: application deadline, students rank top 3 choices and program rank student applicants
- Accommodations for distance from Denver taken into account with ranking
- March: program matching occurs and students are notified

Core clinical programs in the Front Range will meet fundamental requirements of ***continuity and individualization*** as the key guiding principles of this committee. After extensive discussion and review of the literature and best practices, this committee has concluded that a complete conversion to LIC

clerkships is our recommendation. The goal of this committee would be to see the entire curriculum roll to LIC format by 2021 for full implementation of curriculum reform. We propose several early pilot LIC programs for early implementation.

Longitudinal Integrated Clerkships (LIC): expanded opportunities modeled after the DH-LIC

a. Each LIC will foster a small (10 students with dedicated faculty) learning community and individual curricular focus allowing students to individualize their education.
b. Aim to cluster groups of LICs within hospital systems to minimization of cost and sharing of resources between programs while maintaining smaller learning communities.
    i. Each individual program to have its own Director, Coordinator, outpatient preceptors, curricular content focused on area of concentration
    ii. Shared resources in faculty development, student support/remediation, common curricular content, liaison faculty resources, orientation, onboarding.
    iii. There will also be thematic clusters that allow programs with similar curricular areas of focus to collaborate, share resources and determine best practices.
c. Clerkship Time Allotment: diverse LIC programs will allow would achievement of equivalency in terms of time dedicated to the following areas of clinical medicine. This allotment is based on a successful model at the DHLIC; modifications and variation are expected within different settings but this would serve as a rough guideline. In total: 42 weeks of clinical clerkship time.
    i. Internal Medicine: 4 weeks inpatient immersion, weekly half day outpatient clinic
    ii. Surgery: 4 weeks inpatient immersion, bimonthly OR day or half day outpatient clinic
    iii. Pediatrics: 2 weeks inpatient immersion, weekly half day outpatient clinic
    iv. Family Medicine: weekly half day outpatient clinic
    v. Psychiatry: 1 week inpatient immersion, weekly half day outpatient clinic
    vi. Neurology (rehab/MSK): 1 week immersion, bimonthly half day outpatient clinic
    vii. OB/GYN: 3 weeks immersion, bimonthly half day clinic
    viii. Emergency Medicine/urgent care: bimonthly shifts
d. Areas of core clinical content that will have cohort patient requirements without dedicated clerkship/preceptor time: anesthesia, radiology
e. “elective” time/flexibility built into the LIC model by virtue of patient selection for cohort follow up allowing for individualization of the curriculum
f. Rotations currently in the clinical phase that will be moved to the <u>elective</u> post-clerkship phase (backcountry): anesthesia, surgical subspecialties, MSK

2. Full program LIC implementation in 2021
    a. 180 students = 18 LIC programs of 10 each (+/- depending on number of rural sites able to accommodate LIC style learning): priority placed on small learning communities to maximize benefits of peer and program administrative support, unique curriculum themes and areas of focus to allow students to select/match into programs suited to their needs and career interests. All programs and curricular themes are ideas and would be subject to change!
        i. Denver Health cluster
            1. DH-LIC underserved care and social justice (original)
            2. DH-LIC #2 (QI and patient safety)
            3. DH-LIC #3 (advocacy and leadership)
        ii. Colorado Springs Branch cluster – grow to 30 students, 10 in each LIC

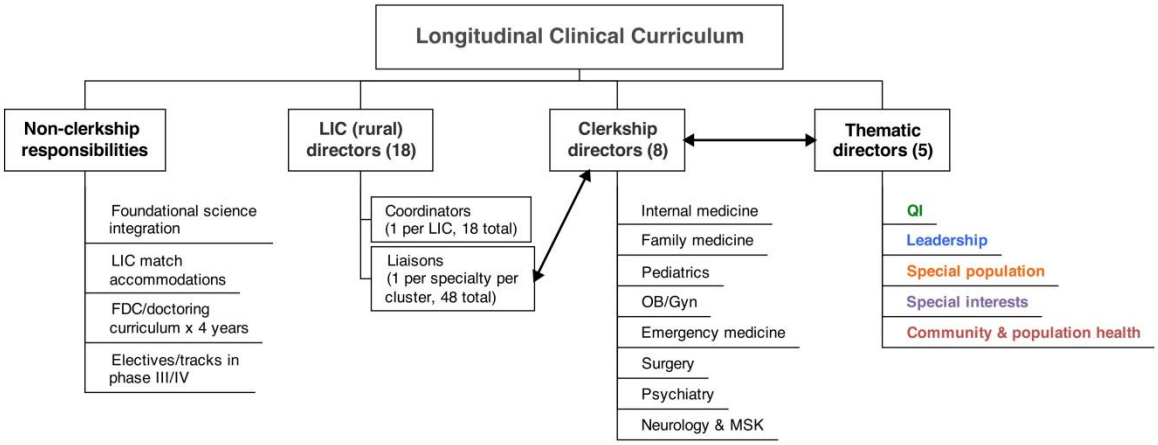
1. CSB #1 leadership
2. CSB #2 community engagement and service
3. CSB #3 quality improvement

iii. Anschutz medical campus cluster/s
   1. AMC Commitment
      1. Care and advocacy for children (CHOC focus)
      2. Care for Veterans (VA focus)
      3. Ethics and humanities
   2. AMC Scholars
      1. Medical education
      2. Clinician scientist/discovery (UCH focus)
      3. Leadership
   3. AMC System Science
      1. Health Systems Sciences
      2. QI and patient safety
      3. Population health

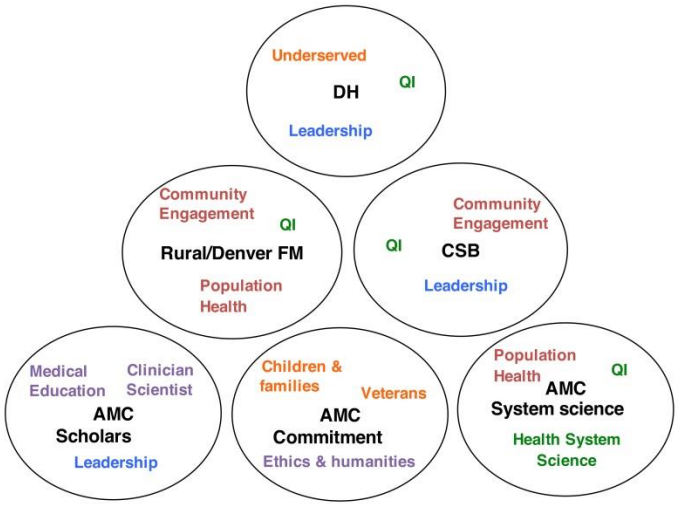
iv. Kaiser/ Denver FM based cluster (Kaiser, St.Anthony's, St. Joes, UCH Lone Tree)
   1. Community engagement
   2. Population health
   3. QI

v. Rural or FM oriented urban sites cluster (all with a curricular focus on community health)
   1. Delta (1-2 students): currently ILMC, AAC, RCC, and sometimes Ob site. Potential for: FM, IM, surgery, OB, EM, peds
   2. Montrose (1-2 students): currently ILMC, AAC, RCC, and sometimes Ob site. Potential for: FM, IM, surgery, OB, EM, peds
   3. Cortez (1-2 students): Currently ILMC. Potential for FM, IM, surgery, EM
   4. Del Norte (1-2 students): currently ILMC site. Potential for FM, IM, surgery, OB, EM, peds
   5. Walsenburg (1-2 students): Currently ILMC. Potential for FM, IM, surgery, EM
   6. La Junta (1-2 students): currently ILMC/AAC/RCC site. Potential for: IM, FM, surgery, OB, EM.
   7. Sterling(1-2 students); currently ILMC site. Potential for: FM, IM, surgery, OB, EM, peds
   8. Alamosa (1-2 students). Currently OB and surgery site, past ILMC site. Potential for FM, IM, surgery, OB, EM, peds
   9. Ft. Collins(1-2 students). Currently AAC/RCC, past ILMC. Potential for FM, IM, peds, OB, surgery, EM, psych.
   10. Greeley(1-2 students). Currently ILMC, past AAC/RCC. Potential for FM, IM, peds, OB, surgery, EM
   11. Grand Junction(1-2 students): current RCC/AAC, former psychiatry and EM. Potential for FM, IM, peds, OB, surgery, EM, psych.
   12. Durango(1-2 students). current RCC/AAC. Potential for FM, IM, peds, OB? , surgery, EM

Administrative structure:



Clusters:



Specific roles and responsibilities:

Longitudinal Clerkship Directors: IM, Surg, Peds, FM, Psych, OB/GYN, Neuro/MSK, EM

- Assessment, grading, clinical competencies, learning objectives, core curriculum, close collaboration with liaisons in each cluster

Thematic Directors: oversee specialized content are that LIC programs have in common between clusters (QI, leadership, special populations, special interests, community/population health).

- Coordinate directors with these areas of curricular focus to share curricular ideas and resources, develop minimum content that all LIC programs should deliver in these content areas

Specialty liaisons/site clerkship directors – shared between LIC programs within a cluster

- Preceptor recruitment, faculty development, ensure equivalency, delivery of core curriculum, grading

Administrative support – each LIC program will have its own coordinator but those 3 individuals will coordinate to share responsibilities for onboarding, offboarding, orientation, IT

- Student clinical scheduling, didactic scheduling, tracking of assignments/cohort patient requirements, administration of exams, organization of student assessment and faculty evaluation, available to LIC director and students, manage Canvas site, coordination with SOM and other LIC programs

LIC director for each unique LIC program (10 students each)

- Student selection, advising, support, clinical and didactic curriculum development, unique program specific content, assessment, grading, coordination with liaisons and other LIC directors at that site, continuity with students and programs in Phase 3-4

Of special note about the administrative structure:
** We anticipate some overlap between positions (ie. A Thematic Director could also be one of the LIC Directors of a program with that area of focus, a Liaison in one program could also be a Clerkship Director for that specialty). This has the advantage of decreasing the administrative burden and allowing leaders to authenticity in their roles as they serve programs in different capacities.
**New positions created in this structure provide opportunities for faculty engagement and professional development.

Step Exam Study Period/vacation:

June – August: Step 1 and 2 study period: 10 weeks

- Recommend a comprehensive basic science exam be administered at the end of Phase I and II to gauge student performance, consolidate basic science knowledge and identify at risk students at need for additional resources.
- Recommend step 2 immediately following clerkships (data shows highest performance on Step 2 after focused clinical time and recent exposure to specialty NBME exams)
- Recommend step 1 to follow at the end of the study period (step 1 increasingly clinically focused with case vignettes so clinical exposure and step 2 preparation would be expected to help in step 1 preparation)
- An alternative approach may be considered for students who have required remediation or support on subject NBME exams

Phase III-IV: Backcountry

22 months

As the backcountry in Colorado is often a place for advanced hikers, skiers, and campers, so too is ours. The backcountry is a space for the advanced development of the professional identity. It certainly includes clinical elements like advanced skills for residency preparation and clinical electives, which is in our scope, but it is also a space for the integration of extramural curricular elements that may be beyond our scope: i.e. humanism, ethics, evidence-based medicine, scholarship, leadership, and service learning.

We have identified major themes for the Backcountry's clinical mission: discovery, individualization, and integration.

•Discovery

- offerings should be directed towards discovery of novel clinical fields, advanced clinical skills, and professional specializations.

•Individualization

- the curriculum should start to be shaped around the student's career aspirations, personal curiosity, or self-identified areas of improvement.

•Integration

- The clinical elements should be integrated with all the other elements. These components should not be silos.

Phase III (10 months):

- **Clinical Discovery** - Elective clinical rotations in non-core clinical curriculum fields and specialties (Anesthesia, Orthopedics, Radiology, Ophthalmology, Dermatology, Urology, Radiation Oncology, etc.). Students required to take minimum number of clinical hours, but specific course are elective.
- **"Back to Basics and Beyond" – Foundational and Social Science Integration** - Small group experiences with dynamic student-centered formats (i.e. interactive TBL/PBL or laboratory experiences) aimed at integrating important principles of foundational and social science introduced in Bedrock (Phase I) and Front Range (Phase II). See the examples below. This would require the cooperation and input from other committees including the Basic Science Reform Committee
    - **Examples**:
      Advanced Cardiology: clinical time in cardiology clinics, cardiac ICU, cardiac diagnostic units; basic science classroom time dedicated to principles of ECGs, advanced cardiac pathophysiology and pharmacology. Interested students might include those in Internal Medicine, Family Medicine, Anesthesia.

      Advanced Orthopedics: clinical time in various orthopedics settings including clinics, PT, OR; basic science classroom time dedicated to anatomy, histology. Interested students might include those in Orthopedics, PMR, rheumatology.

      Primary Care and Community Health: clinical time in primary care settings; basic science class room dedicated to epidemiology, biostatistics, pharmacology.

- **Field Studies - Mentored Project Time/Track Time –** each student is required to complete a longitudinal mentored scholarly project – specifics TBD in conjunction with Curiosity reform committee. May want to consider aligning with Phase II programs and tracks to allow students to develop projects and mentors as they are doing clinical clerkships, with flexibility to move tracks in Phase III.
- **School of Medicine Specialization –** we recognize that the SOM Executive Committee and the Dean's office may want to have a school wide specialization is some area of medicine. We think the backcountry framework would be a good place for these elements and in the examples below, we have named them "SOM Special"

- **Longitudinal Clinical Time –** students will return to their clinical community site from Phase I to serve as leaders of QI teams and peer mentors for first year students. They will continue to engage there in IPE and system science learning. Students will also designate a longitudinal clinical preceptor to continue weekly sessions with. Goals of this will be reinforcement of clinical skills, patient centered care, and longitudinal relationships with patients and faculty. Students may choose from a preceptor from their LIC program or select a new faculty member if a specialty of their choice if that best serves their career goals. But students must continue in this clinical setting for the remainder of the backcountry curricular time.
- **Advising -** As students transition into Phase 3 Backcountry, their curriculum will become largely individualized. In order to maintain a rigorous course schedule and meet requirements related to number of electives, independent project work, selection of electives that will support their career trajectory, etc., we recognize that the SOM will need to invest heavily in an in depth advising system. We propose this occur partially through the Bedrock Foundations small groups coaches, but realize that students will also need additional advising that is specialty specific and will need project mentors as well. This robust support network will be critical for students to explore their careers, produce meaningful scholarly work, elective options, and residency applications.

Phase IV (12 months):

- **Acting Internship** - The Acting Internship will consist of a 4-week rotation in your chosen field. The details of this course will be decided by the respective department. We recommend consideration of a required IM acting internship and/or 2 acting internships.
- **Electives –** these will all integrate basic and clinical science
- **Externships**
- **Advanced Residency Preparation**
- **Time allotted for ERAS applications, interviews**

Table 1. Example Phase III-IV Schedule

Phase III										
Month	1	2	3	4	5	6	7	8	9	10
Element	Discovery	Discovery	Discovery	B2B&B	B2B&B	Advanced Clinical	B2B&B	B2B&B	Advanced Clinical	SOM Special
Example	Radiology	Neuro-surgery	Anesthesia	Surgery I	Surgery II	Ortho	Surgery III	Surgery IV	ER	
Integration				Operative Physiology	Surgical Anatomy		MSK Anatomy	Operative Pharma-cology		

Phase IV										
Month	1	2	3	4	5	6	7	8	9	10
Element	Acting Internship	Advanced Clinical	Discovery	Elective	Elective	Elective	Elective	Elective	Residency Prep	SOM Special
Example	Surgery	Ortho II	PM&R	Externship I	Surgical Oncology	Sports Medicine	History of Medicine	ER	Surgical Skills	
Integration										

Suggested Outcome measures/ Evaluation of program

Overarching points to consider:

1. When possible, use scales and questions now such that we can collect data now that we can also collect later, so we can compare data before and after curriculum reform
2. Coordinate with the evaluation team in the Dean's office
3. Coordinate with the current communication skills program leaders
4. Coordinate with other curriculum reform committees (assessment, basic science, etc.)

- Outcomes related to the longitudinal clinical curriculum for progression through the curriculum and graduation of medical students
- Suggestions for how to assess student competence for each outcome
- Suggestions for how to evaluate curricular success for each outcomes

1. General medical knowledge needed for the practice of medicine
    a. Competence: grade of "pass" in all science courses in the curriculum (we need measures/evidence that determine "pass")
    b. Competence: passing clinical evaluations and student assessments in Phase III/IV: Backcountry (where science is integrated in clinical practice) (we need measures/evidence that determine "pass")
    c. Competence: passing score on USMLE exams (passing score is set nationally)
    d. Competence: passing score on all administered NBME exams (shelf exams) OR passing score on comprehensive clinical science exam (number and timing of administrations of the comprehensive clinical science exam need to be discussed and determined) (review percentile/standard deviation requirements for a passing score)
    e. Evaluation: monitor pass rates on a-d; do standard-setting on acceptable pass rates and develop plans to adjust curriculum and develop remediation to achieve 100% pass rate

2. Clinical skills needed to begin Phase II: Front Range
    a. Assessment: Skills in taking a history needed to enter clerkships after 12 months
    b. Assessment: Skills in doing a physical exam needed to enter clerkships after 12 months
    c. Assessment: Skills in basic communication needed to enter clerkships after 12 months
    d. For a-c will need to agree upon required competence for each area for progression and plan for remediation when needed; will work with CAPE and current FDC program to help develop assessments
    e. Evaluation: number/percentage of students that reach required levels of competence in a-c in time to enter Phase II: Front Range; number of students needing remediation and resources/time needed to accomplish remediation

3. Clinical skills needed to begin intern year
    a. Assessment of competence: level 3a or 3b of supervision in each of the core EPAs (we need measures/evidence that determine supervision levels)
    b. Assessment: Clinical evaluations (we need measures/evidence that determine "pass")
    c. Assessment: Clinical Practice Exam or other standardized patient exams (we need measures/evidence that determine "pass")

    d. Evaluation: Monitor students' supervision levels across the four years of medical school; analyze post-graduation program director surveys of graduate readiness

4. Empathic, service-oriented, patient-centered physicians who are prepared to be leaders (including patient-centered communication)
    a. Assessment: competence in advanced communication skills (standardized patient assessment) (we need measures/evidence that determine "pass")
    b. Assessment: Empathy scale scores (coordinate with evaluation team in Dean's office)
    c. Assessment of patient centered communication (work with the CAPE and current communication program to develop assessments and required level of competence for progression)
    d. Assessment: documentation of community service that is related to clinical experiences in portfolios
    e. Assessment: documentation of leadership experiences in clinical settings in portfolios
    f. Evaluation: compare communication skills assessment and empathy scale scores before and after curriculum reform; develop rubric to review community service and leadership experiences in portfolios

5. Proficiency in team-based care
    a. Assessment: documentation of participation in team-based care in portfolios
    b. Assessment: 360 feedback and evaluations (coordinate with interprofessional education, clinical integrations assessment tool that they are piloting)
    c. Assessment: supervision level on core EPA 9: Collaborate as a member of an interprofessional team
    d. Evaluation: develop a rubric for portfolios; agree on required level of competence for 360 evaluations; supervision level 3a or 3b on core EPA 9

6. Skills for lifelong learning in medicine
    a. Assessment: documentation of self-reflection, individual learning goals, and innovation/scholarship/research related to clinical experiences in portfolios
    b. Assessment: quality of individual learning goals (score some learning goals with Learning Goals Scoring Rubric, Lockspeiser et al., MedEdPortal)
    c. Evaluation: develop a rubric for portfolios; set competence level for individual learning goals

7. Engagement in individualized learning
    a. Data: individual learning plans for clinical experiences during Phase III/IV: Backcountry
    b. Data: electives offered and completed
    c. Evaluation: determine percent of students who write individual learning goals and develop individual learning plans; compare electives offered and completed before and after curriculum reform

8. Career outcomes
    a. Data: residency match statistics (number/percentage of students who match successfully, match in their chosen specialty, match at desired residencies)
    b. Data: number/percentage of graduates who practice rural medicine
    c. Data: number/percentage of graduates who pass board exams
    d. Data: number/percentage of graduates who are reported to licensing boards

e. Evaluation: compare match statistics, number/percentage of graduates who practice rural medicine, pass rate for board exams among graduates, and reports to licensing boards among graduates before and after curriculum reform

Outcomes related to the longitudinal clinical curriculum for the learning environment:

9. Establishment of longitudinal relationships with patients and families
    a. Data: documentation of longitudinal patient care in portfolios
    b. Data: record placement of students at sites/in LICs that offer longitudinal relationships
    c. Evaluation: agree on a successful level of longitudinal clinical experience

10. Retention of excellent clinical faculty
    f. Data: course evaluations (include student measures of faculty teaching, observation, feedback)
    g. Data: faculty engagement/satisfaction with clinical teaching
    h. Data: log of sites and faculty that accept students for clinical experiences
    i. Data: log of faculty that complete student clinical evaluations
    j. Data: responses to clinical education questions on the Medical Student Graduation Questionnaire (MSGQ)
    k. Evaluation: monitor responses to course evaluations, faculty responses, logs of faculty engagement in precepting, and annual aggregate MSGQ responses

11. Learning environment that reflects patient-centered care
    a. Data: patient-centered care questions on Medical Student Graduation Questionnaire (MSGQ)
    b. Evaluation: monitor annual aggregate MSGQ responses

12. Minimization of experiences of gender, sexual orientation, and racial bias
    a. Data: bias questions on Medical Student Graduation Questionnaire (MSGQ)
    b. Evaluation: monitor annual aggregate MSGQ responses

13. Learning environment that facilitates learning and a growth mindset among students and faculty
    a. Data: ongoing iterative qualitative feedback gathered through open-ended text responses on questionnaires
    b. Data: student focus groups
    c. Evaluation: qualitative analysis of text and focus group data

14. Minimization/reduction of student mistreatment
    a. Data: course evaluations
    b. Data: student mistreatment questions on Medical Student Graduation Questionnaire (MSGQ)
    c. Evaluation: monitor annual aggregate MSGQ responses

15. Minimization/reduction of student burnout
    a. Data: burnout scale (coordinate with evaluation team in Dean's office)
    b. Evaluation: compare burnout scores before and after curriculum reform

Pilot ideas and next steps

Proposed Staged implementation:
Stage 1 (AY 2019-2020)

- Allocate resources to begin planning for implementation of Stage 2 (FTE required to plan for pilot programs)
- Pilot learning Community in Place of 1-on-1 preceptor in FDC
    - Concept being piloted at AF Williams with students integrated in QI team
- Develop Small group/coaching structure and begin recruitment and development of faculty coaches
- Review evaluation data collected now to determine if we have adequate data to be able to assess before and after outcomes. May need to add additional tools or assessments to capture our "pre-reform" state accurately depending on what outcomes are most valued.
- Needs assessment studies to inform next steps:
    - Clinical training sites for development of LIC programs
    - Individualization/specialization of students in the post-clerkship period (advising needs, required courses and elective selection, and ways to create meaningful cohorts of students with similar career interests): recent graduates, program directors, current students.
    - Post-clerkship TBL/PBL Foundational/Social and Clinical sciences integrated curriculum development: basic science and clinical faculty, current students and recent graduates.
    - Residency Bootcamp content: recent graduates, program directors, current students, and feedback from existing ICC components.

Stage 2 (AY 2020-21)

- Consider moving Step 1 after Phase III clerkships for class of 2022
- Conversion of DH to all LIC programs with 30 students in 3 programs, building on success of DH-LIC and institutional support
- Modify CSB into smaller LICs with areas of curricular concentration and expansion to 30 students with 10 in each of 3 programs
- Consideration of development of Kaiser LIC if institutional support given this program further along in development
- Consideration of development of UCH clinician scientist LIC
- Define and describe competencies in the clinical curriculum to support competency based assessment and equivalency across LICs
- Pilot clinical/foundational science integrated electives in Phase IV
- Trial rural remote learning for implementation in rural LICs
- Additional resources allocated to plan for full implementation

Stage 3 (AY 2021-22)

- Full implementation