

# Redistribution of Basic Medical Science Content during Undergraduate Medical Education Curricular Reform

An Expert-Derived List of Recommendations

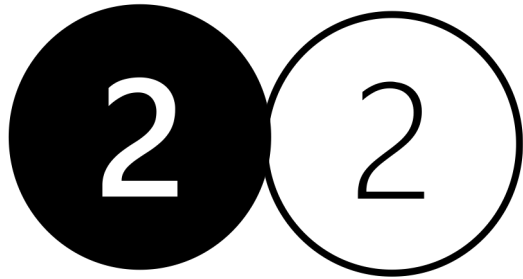
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AME Education & Innovation Symposium 2022

# Outline

- Background and Project Aim
- Study Design
- Results
- Discussion

# Background



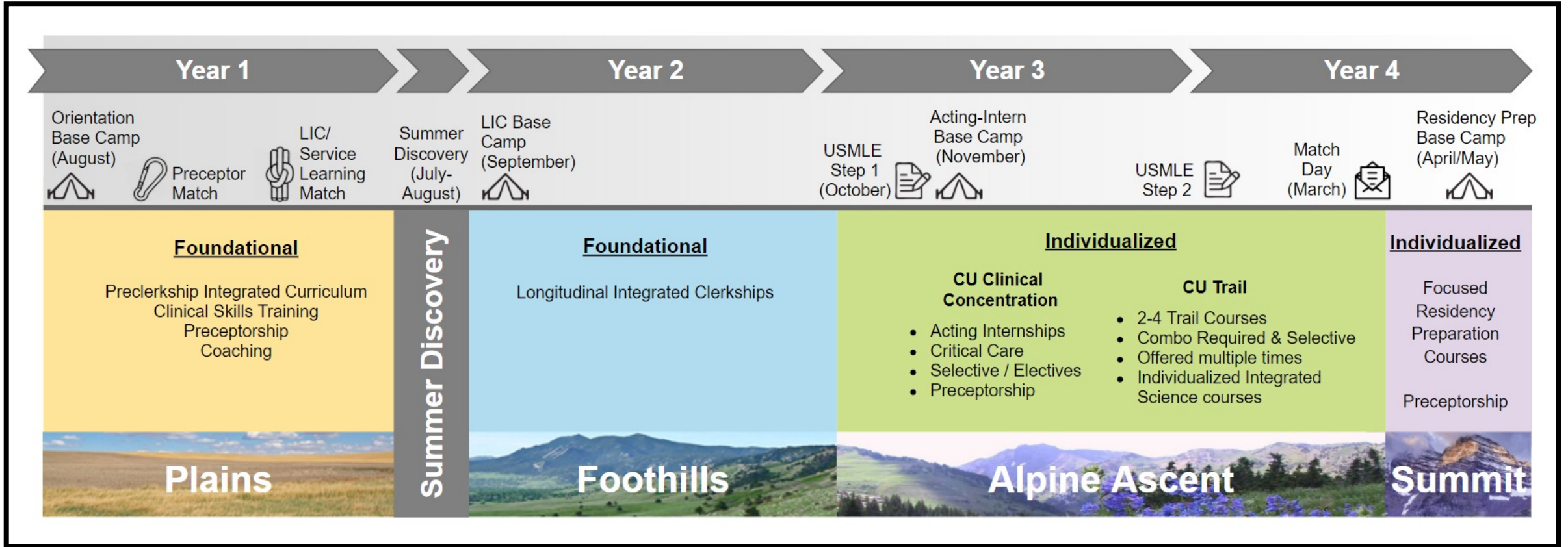
The traditional 2+2 model is structurally inflexible and not learner-centered



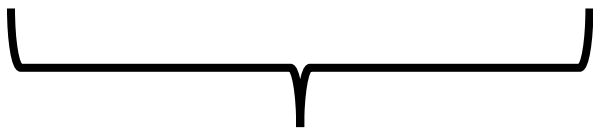
Contemporary calls for UME curricula reform emphasize competency-based milestones with earlier clinical immersion



Variable reform strategies around *shortened* preclinical curricula have been described - with mixed results



<https://medschool.cuanschutz.edu/education/current-students/curriculum/curriculum-reform>



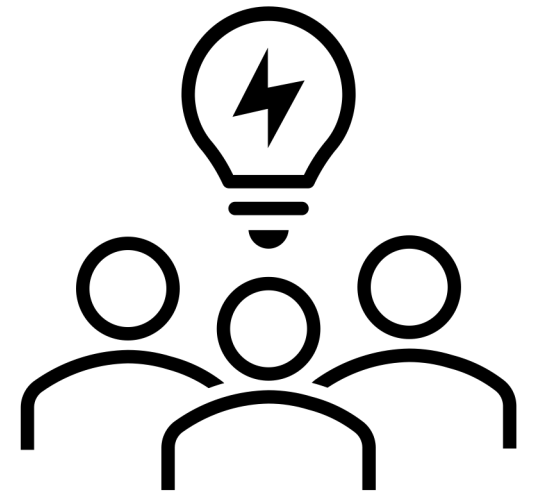
19 → 13 months

# Goal

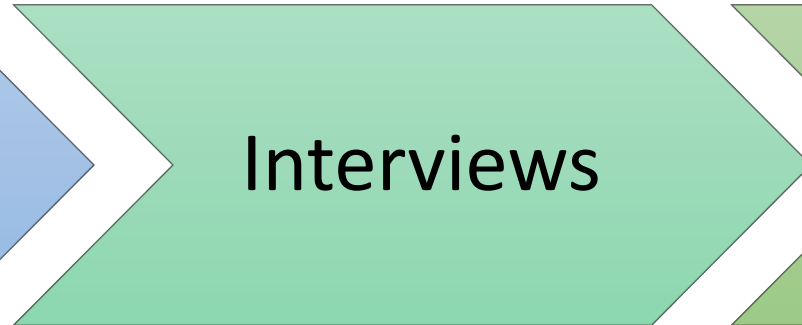
- Create a list of expert-derived recommendations to guide how traditional pre-clinical instructional topics can be *redistributed* within reformed curricula

# Study Design: Modified Delphi process

- Data extraction from the collective expertise of a group
- Participants:
  - UME educators from schools that have undergone reform within the past 5 years
  - Institution must have:
    - Pre-clinical year <18 months AND
    - USMLE Step 1 requirement *after* clerkship year



Snowball sampling  
process, with aim of 10  
participants

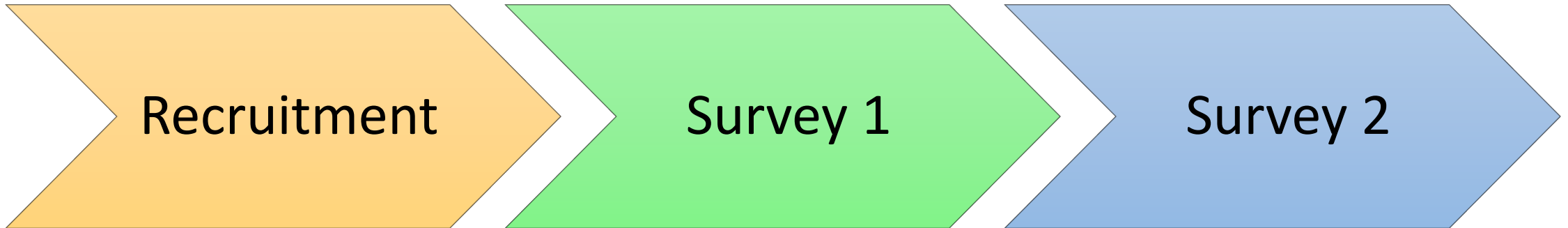


Thematic coding of  
interviews



30-60 minute semi-  
structured interviews  
regarding content  
placement decisions

Removal of recommendations with <70% somewhat/strong agreement  
OR <70% somewhat/strong perceived importance. Minor modifications  
also made based on participant comments



Increased census goal  
using a snowball sampling  
procedure

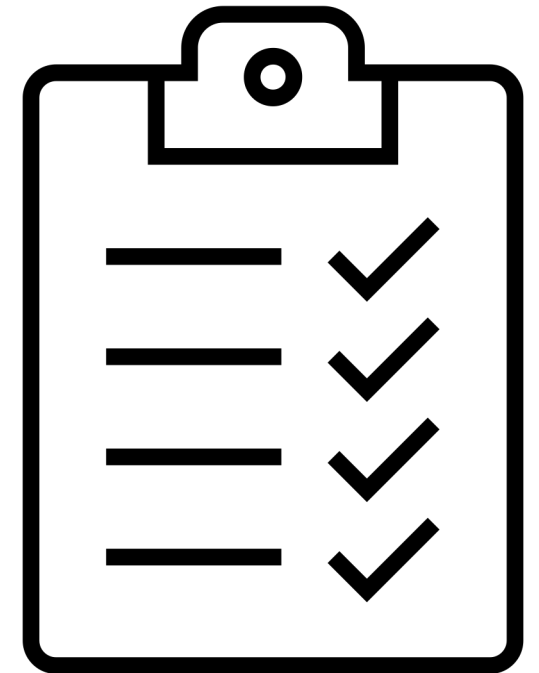
Participants asked to rate  
each recommendation  
with regards to *level of  
agreement* and *perceived  
importance* on a 5-point  
Likert scale

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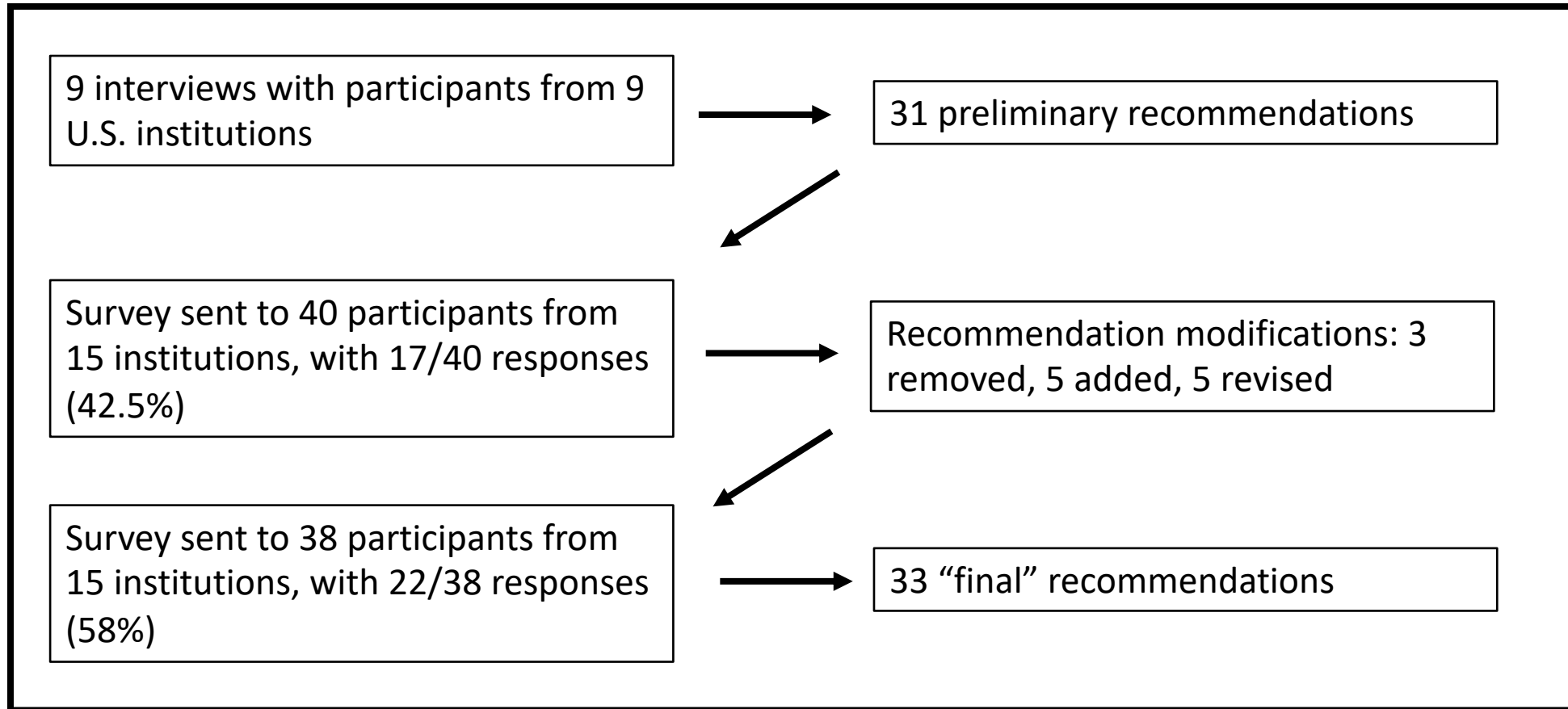
## Consensus-formed list of recommendations

Statements with which >70% of participants strongly or somewhat agreed



# Results

Flow Diagram of study participants and recommendations



## Decision Makers

1. The decision-making group should include members with diverse clinical and basic science backgrounds.
2. The decision-making group should be small and centralized to allow for integration and facile decision-making.
3. The decision-making group should purposefully engage and seek input from all stakeholders, including students and clerkship directors.
4. There should be regular meetings of the decision-making group.
5. The decision-making group should be empowered by the dean or other authority to make decisions.
6. The curriculum revision requires a faculty-wide acknowledgement of some loss of personal faculty autonomy, including detailed coverage of individual research interests, to serve the collective goal of integration.
7. With a common goal in mind, the decision-making group should be prepared to let go of topics or approaches to teaching that have been used historically.
8. The decision-making group should include a student representative.
9. The decision-making group should include members with diverse personal backgrounds.
10. The decision-making group should include members with institutional influence.
11. The decision-making group should include an administrative staff member representative

## Curriculum Strategies

1. An explicit goal of the curriculum should be to develop students' critical thinking skills with a goal of producing self-directed, life-long learners. It is not possible to teach students everything they need to know.
2. A school should not feel bound to teach everything that is on the USMLE step exams. Students should be expected to perform some independent study and memorization towards Step exam preparation.
3. When designing the curriculum, a school should use evidence-based learning strategies-
4. There should be consistency from week-to-week in the schedule of learning activities, with an aim of decreasing cognitive load.
5. From day one, content should be integrated and taught in the context of clinical cases.
6. All basic science content should be taught with explicit clinical relevance.
7. Longitudinally-dispersed basic science instruction should be explicitly called-out so students are aware that it is both being taught, and is foundational.
8. The leaders of a course should include a team of basic scientists and clinicians to ensure integration.
9. There should be consistency in the format and timing of assessment during each phase of the curriculum.
10. There should be a longitudinal view to content placement with deliberate spiraling across the four years.
11. There should be points in the curriculum where a student should not be allowed to proceed unless they have met clear performance or learning milestones.

## Pre-Clinical Strategies

1. The time devoted to foundational sciences in the pre-clerkship phase should not be condensed without altering the content taught. Rather, maintain the breadth of content covered and not the depth.
2. Active surveillance for areas of topic redundancy is necessary to shorten the pre-clerkship phase.
3. To reduce time in the pre-clerkship basic science phase, normal physiology should not be separated from pathophysiology, rather teach the two together.
4. Topics chosen for the pre-clinical phase should be something that all students need to know rather than topics that will be pertinent for only some students pursuing training in specialized fields.
5. Topics chosen for the pre-clinical phase should help students understand the “why” or underlying mechanism of a clinical condition.
6. Specific biochemical pathways should only be taught if relevant to clinical pathology.
7. Content covered on the new MCAT should be decreased in the pre-clinical phase.

## Clinical Strategies

1. During clerkships, schools should build in review of basic science content with the opportunity to explore more advanced concepts.

## Post-Clerkship Strategies

1. There should be explicit inclusion of basic science instruction in the post-clerkship phase.
2. After clerkships, basic science instruction should be individualized to a student's preferences and career path.
3. After clerkships, basic science content should be taught within a clinical context and involve a deep dive into that topic.

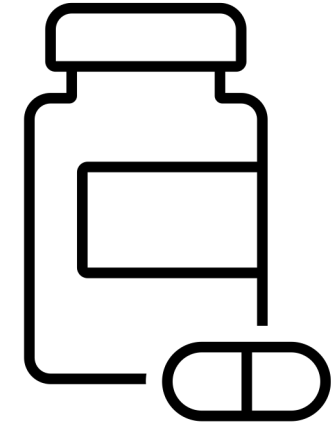
# Discussion



Vertical integration of basic science into all curricular phases with evidence-based strategies



Topics in the pre-clinical phase should be *need-to-know* concepts with an emphasis on development of critical thinking skills



Basic science should be taught within clinical context.

Historically-taught concepts may no longer have relevance

# Acknowledgements

- Jennifer Adams ★
- Tai Lockspeiser
- Sheilah Jimenez
  
- All of the 2020-2021 TSP cohort

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