CAPES Mission Statement

• To prevent suicide by accelerating delivery of evidenced-based, compassionate suicide care.

• P50: To study how suicide-care technologies can support this primary mission
True north: The effort must advance suicide prevention and at least one additional domain
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CAPES will accelerate implementation of suicide-related best-practices through leveraging technologies

**Settings**
- Emergency departments
- Inpatient units
- Primary care
- Mental health outpatient
- College health centers

**Key Performance Elements, EBPs (Selected)**
- Identify: validated screening and assessment tools, machine learning algorithms using health data
- Engage: Safety Planning Intervention, Lethal Means Safety Counseling
- Treat: CAMS, CBT-SI
- Transition: ED-SAFE post-visit calls, Caring Contact Cards

**Technologies**
- Direct: acts as the performance element itself, e.g., computerized screener
- Enabling: helps systems implement the performance element, e.g., EHR screener flowsheet

**Implementation Studies**
- Common EPIS framework
- Deployment focused
- Common measures and data elements
- Synthesize cross-setting similarities, differences
CAPES will accelerate suicide prevention through multi-channel dissemination strategies

**Individual Projects**
- Jaspr (Signature)
- CATS (Exploratory)
- ADAPT (Exploratory)
- LEMURS (Exploratory)
- Pilot Projects
- New projects

**Cross-Center Projects**
- EHR Best-Practice
- Innovation Briefs
- Accelerating suicide-care tech implementation
- EPIS Measure development
- Suicide implementation outcome measure

**Resources**
1. Knowledge and science (e.g., presentations, articles, monographs)
2. Suicide care technologies, including technical documents
3. Implementation know-how (e.g., blueprints, toolkits)
4. Economic summaries
5. Research manuals of procedures
6. Materials for lay public
7. Databases and support documents

**Channels**
1. Scientific/Trade conferences
2. Scientific journals
3. CAPES website
4. CAPES Bulletin
5. UMass Office of Communications
6. Social media (multi-platform)
7. eScholarship@UMassChan
8. Work with influencers
9. NIMH Data Archive
10. Business development, technology transfer
11. Healthcare System Consortium (direct)

**Adoption**
1. Healthcare systems
2. Clinicians
3. Scientists/Researchers
4. Healthcare technology companies
5. Influencers
6. Lay public

**Public Health Impact**
1. Improve identification and measurement of suicide risk
2. Improve EBP delivery for those with risk
3. Improve patient-intervention targets
4. Decrease suicidal behavior and suicide
CAPES will accelerate suicide prevention through multi-channel dissemination strategies

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UMASS CHAN MEDICAL SCHOOL
(Emergency Medicine, Population and Quantitative Health Sciences, Psychiatry)

- Worcester Polytechnic Institute
- UC San Diego
- UMass Memorial Health
- University of Colorado
- Jaspr Health
- Adaptive Testing Technologies
- PointClickCare
- Programination
- Precision Healthsoft
- UMass Campuses (Amherst, Lowell)
- Butler Hospital
- Ohio State Medical School
- Healthcare System Consortium
- Zero Suicide Institute
- Epic
- Cerner
- Cogitas Consulting
- Q2i

Organizations

Primary Faculty

Affiliate Faculty

Corporate Partners
There is value in being a part of CAPES.

1. Access to an incredible network of scientists across a range of disciplines
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4. Access to Pilot Project Funding

5. Assistance with building, submitting new grants
Administrative Core
Boudreaux, Kiefe
Build and support an Administrative Core

1. Support CAPES operations;
2. Select and fund R03-like Pilot Projects;
3. Recruit and manage stakeholders;
4. Train scholars;
5. Promote synergy across faculty and projects;
6. Keep abreast of latest best-practices, technologies;
7. Disseminate resources; and
8. Evaluate CAPES progress, plan future efforts (with Methods Core)
<table>
<thead>
<tr>
<th>Name</th>
<th>Director</th>
<th>Purpose</th>
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</table>
| Operations            | Rahmoun  | • Support the Center’s infrastructure and operations.  
|                       |          | • Establishes/Follows milestone-driven management plan, communication plan, and meeting plan.  
|                       |          | • Disseminates study-related deliverables, including updating the Center website and social media.  
|                       |          | • Assists in management of stakeholder panels and Healthcare System Consortium.                                                                                                                                                                                        |
| Education and Scientific Development | Nunes    | Builds infrastructure for soliciting, reviewing, selecting, and executing up to 2 pilot feasibility projects each year proposed by early-stage or established investigators and trainees.  
|                       |          | • Organizes training opportunities across a range of topics and disciplines important for suicide-related care translation and research: didactics, workshops, mini-courses, and hands-on project experiences.  
|                       |          | • Vets and selects the Emerging and Advanced Collaborating Scholars.                                                                                                                                                                                                     |
# Admin Core Units

<table>
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<tbody>
<tr>
<td>Dissemination and Community Engagement</td>
<td>Larkin</td>
<td>• Builds and engages Stakeholder Panels and Healthcare System Consortium to maximize their potential for synergy across Center projects.</td>
</tr>
<tr>
<td></td>
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<td>• Executes the dissemination plan described in the Admin Core’s <em>Master Resource Sharing Plan</em>, including working with Stakeholders to develop direct-to-community materials.</td>
</tr>
<tr>
<td>Business Development</td>
<td>Dunlap</td>
<td>• Very experienced Advisors with range of practical and academic business and tech transfer experience.</td>
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<tr>
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<td></td>
<td>• Mentors each project team in business, commercialization, and intellectual property related issues.</td>
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<td>• Rich connections with business and organizations designed to foster commercialization.</td>
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# Admin Core Units

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| Ethics   | Nebeker     | • Provides guidance related to digital health ethics and human subjects’ protections.  
• Provides training opportunities in digital health ethics. |
| Evaluation | Pivovarova  | • Evaluate CAPES  
• Comprehensive evaluation of all CAPES activities and public health impact  
• Includes evaluation by Internal and External Advisory Boards. |
Methods Core
Kiefe, Agu, Yang
Build and support a Methods Core

1. Provide implementation science, study design, data analysis and management, economics, machine learning, and person-centered design expertise and technical infrastructure;
2. Advance methods, including analytic and implementation methods, to study the implementation of suicide care technologies;
3. Create guidance on best practices in health system implementation of suicide care technologies, including operationalizing how they can facilitate Zero Suicide and identifying trans-setting and setting-specific implementation drivers; and
4. Evaluate all CAPES research activities, plan future efforts.
There is value in having access to the Methods Core

The Methods Core provides, through its 6 Units:

1. Consultations with Unit scientists
   a. for CAPES funded projects
   b. New project development

2. Technical services for funded projects, e.g.
   a. Statistical computing
   b. Database development/management/QC
   c. Economic evaluations

3. Cross-project harmonization and synthesis

4. Evaluative performance feedback
<table>
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| Design, Data, and Analysis | Barton, Yang | • Support design & analysis of CAPES projects  
• Track analytic and publication activity across projects  
• Perform database development/management/QC  
• Harmonize data collection across all projects  
• Offer psychometric expertise  
• Develop/disseminate new stat/epi methods for suicide prevention |
| Implementation Science | Lemon, Larkin | • Support integration & measurement of EPIS framework  
• Hep select implementation strategies adapted from ERIC  
• Harmonize implementation outcome measures using Proctor taxonomy  
• Support Stakeholder Panels and dissemination efforts using Implementation Science  
• Contribute to development of new implementation measures |
## Methods Core Units

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| Machine Learning (ML)         | Agu               | • Work with ADAPT and LEMURS on ML system design & implementation  
• Develop innovative ML learning approaches for suicide prevention  
• Provide ML expertise for new study design  
• Work with Ethics Unit re ethics in AI |
| Person-centered design        | Gerber, Tulu      | • Engage stakeholders to refine prototypes  
• Develop innovative design approaches for suicide prevention  
• Ensure user-centric, culturally and equity tailored interventions  
• Help development and support new studies involving person-centered designs |
## Methods Core Units

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<tr>
<td>Economic Evaluation</td>
<td>Clements</td>
<td>• Advise on economic evaluations for CAPES projects, funded and future &lt;br&gt; • Identify data capture needs for economic evaluations &lt;br&gt; • Perform economic valuations &lt;br&gt; • Participate in policy-relevant discussions</td>
</tr>
<tr>
<td>Evaluation (joint Unit of Admin &amp; Methods Cores)</td>
<td>Pivovarova</td>
<td>• Evaluate CAPES &lt;br&gt; • Comprehensive evaluation of all CAPES activities and public health impact &lt;br&gt; • Includes evaluation by Internal and External Advisory Boards.</td>
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Jaspr (Signature Project)
Boudreaux, Kiefe, Gerber
Jaspr: get better while you wait!
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Jaspr: get better while you wait!
Jaspr: get better while you wait!
Jaspr: is it efficacious, effective, and implementable – all in one study!

- Is it efficacious?
- Is it effective?
- What factors drive implementation success?
CATs (Exploratory Project)

Davis-Martin, Tulu
Computerized Adaptive Tests (CATs) can be Transformative in identifying and tracking Suicide Risk in Primary Care
Patient takes CAT-MH

A2

Next steps based on CAT-MH results

A3

CAT-MH results
ADAPT (Exploratory Project)
Liu, Rothschild
ADAPT: Automated, Data-driven, AdaPtable, and Transferable learning for suicide risk prediction

Project Leads: Feifan Liu, PhD, UMass Chan; Anthony Rothschild, MD, UMass Chan

Goals: Explore advanced AI techniques to build an automated end-to-end pipeline to guide the transfer of existing suicide prediction models to other healthcare systems and clinical contexts for wide AI adoption and dissemination.

Machine Learning for suicide prediction has been gaining more attention

Lack of tools to assess and improve prediction model’s generalizability

Gaps between research results and clinical utility impede wide adoption
Applying AI Techniques for Better Model Adaption

ADAPT specific aims

Aim 1
• Assessing generalizability and adaptability of NIH funded MHRN risk prediction model
  • Primary care and mental health specialty settings (MHRN and UMMH)

Aim 2
• Developing the ADAPT pipeline for automatic adaption
  • Preprocessing, model adaption, hyperparameter tuning, interpretation

Aim 3
• Exploring deep learning for suicide risk prediction (DeepSuicide)
  • Assessing ADAPT’s usability, acceptability, and feasibility
LEMURS (Exploratory Project)
Dixon-Gordon, Rundensteiner
**Exploratory Project:**
**Leveraging Early Mental Health Uncovering Risk for Suicide**

**Goal:** Streamline universal suicide risk screening and monitoring of college campuses plagued by a high rate of onset of suicidal thoughts/behaviors.

**Approach:** Design Smartphone App that leverages passive smartphone data to derive a suicide risk index monitored via Clinician-facing Dashboard.
Aim 1
• Stakeholder interviews to understand needs of student and clinician users
  • 8 students, 4 clinicians, 2 staff

Aim 2
• Develop LEMURS dashboard for risk monitoring and integrate with LEMURS app
  • 4 clinicians, 2 staff

Aim 3
• Evaluate feasibility of LEMURS by correlating with daily self-reported suicidal thoughts/behaviors
  • 40 students, 2 clinicians
Timeline
Faculty orientation, Personnel onboarding, Selecting stakeholder panels, orienting EAB

JASPR, ADAPT, CATS, LEMURE Projects & Training
Train emerging and advanced scholars.

Create guidance on best practices in health systems. Disseminate Center research, resources, trainings, and products.

Center personnel onboarded
Initial Summit has been held
Website is live
Collaborating Scholars Selected
Two Pilot Projects Awarded
EAB finalized
Stakeholder Panels activated

Annual summit held
Center evaluation performed (IAB/EAB)
All proposed projects have been started and have had at least one milestone review
Significant progress toward cross-center projects has been made

2023

Center personnel onboarded
Initial Summit has been held
Website is live
Collaborating Scholars Selected
Two Pilot Projects Awarded
EAB finalized
Stakeholder Panels activated

Annual summit held
Center evaluation performed (IAB/EAB)
All proposed projects have been started and have had at least one milestone review
Significant progress toward cross-center projects has been made

2024

Annual summit held
Center evaluation performed (IAB/EAB)
All proposed projects have reached their anticipated milestones
White paper for EHR cross-center project has been completed

2025

Annual summit held
Center evaluation performed (IAB/EAB)
R01s for Exploratory Projects submitted
White paper for other cross-center project has been completed

2026

Annual summit held
Center evaluation performed (IAB/EAB)
Renewal submitted

2027

2028
2023

April
Kickoff

May
JASPR
Part A start

June
Initial Summit
EAB, IAB

July
Pilot Projects Reviewed
Pilot Projects Awarded

August
Scholars Selected

September
Website Launch
ADAPT CATS Start

October
Jaspr Enrollment Begins

November

December
LEMURS
Prep
Thank you for your support and engagement in our common effort to prevent suicide.
Extra Slides
Example of how the various technologies can be integrated

**Identify:**
Identify and Assess Patients At Risk

- ADAPT: Machine Learning Algorithm Identifies a Patient At Risk
- CAT: Clinician Orders CAT to be Administered at Rooming, Prior to MD Walking into Room

**Engage:**
Develop care pathway, safety plan

- High Risk: Same Day Behavioral Health Evaluation, in office, crisis center, telehealth, or ED per resources
- OP BH Treatment CAMS

- Mild-Moderate Risk: Jaspr administered Safety Plan Consider other treatments and referrals, per available resources

**Treat:**
Treat drivers of suicide risk

Negligible Risk:
Reassess annually

CAT Results Inform Algorithm

Human in the Loop Decision Making Informs Algorithm
Breakdowns in suicide care technology adoption and implementation and how CAPES will address it

**Translation Breakdowns**
- Never makes it to market
- Health system does not purchase it
- Not supported by larger health system drivers (policy, reimbursement)
- Input device (hardware) not available
- Poor usability
- Patient can’t access prior to being seen by clinician
- Results/Tools are outside of EHR
- Results/Tools “buried” in EHR
- Inconsistent with workflow
- Poor training
- Results not interpretable
- Unsure how to communicate results to patient
- Follow-up actions not clear
- Slows workflow
- Results do not cross healthcare systems
- Results/Tools not accessible after encounter

**New Suicide Care Technology**
1. Health System Makes it Available
2. Patient Access and Engagement
3. Clinician Access to Tools/Results
4. Clinician Action
5. Post-encounter Access

**CAPES Strategies**
- Develop business plan to get to market
- Provide compelling value propositions for adoption
- Use both pull + push dissemination strategies
- Enhance usability
- Implementation blueprints to guide hardware, workflow, access
- EHR integration
- Build intuitive access, user friendly workflow
- Build good trainings and just-in-time job aids
- Create intuitive reports/data visualization
- Guide provider/patient communication
- Maximize efficiency
- Integrate with Health Information Exchanges
- Build resources to support “bridging the gap”