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**Addressing the National Emergency
of Self-Injury & Suicide
Among Children & Adolescents**

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PediMIND

Mood, Imaging, & NeuroDevelopment

 Mass General Brigham  McLean HOSPITAL
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Disclosures:

- **Current funding:**
 - R01MH111542 (brain mechanisms of irritability in children)
 - R01MH110379 (brain mechanisms of NSSI & youth suicide)
 - K24MH110402
 - Hood Foundation Major Grant (brain mechanisms of irritability and suicide in children)
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 - NARSAD
 - Am Foundation for Suicide Prevention
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R21/33MH095850, K22MH074945
- **No industry support**

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Learning Objectives:



- (1) To review the magnitude of the related but distinct problems of youth suicide and non-suicidal self-injury (NSSI, aka "self-cutting")
- (2) What can be done to address youth suicide now?
- (3) How can we work together now to ensure a brighter future?

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COVID has exacerbated need for better child & adolescent mental healthcare

Pediatricians, Child and Adolescent Psychiatrists and Children’s Hospitals Declare National Emergency in Children’s Mental Health

AACAP, AAP, and CHA call on policymakers at all levels of government to act swiftly to address mental health crisis

Washington, D.C., October 19, 2021 – Today, the American Academy of Pediatrics (AAP), the American Academy of Child and Adolescent Psychiatry (AACAP) and the Children’s Hospital Association (CHA) together representing more than 77,000 physician members and more than 200 children’s hospitals, **declared** a national state of emergency in child and adolescent mental health and are calling on policymakers to join them.

FOR IMMEDIATE RELEASE **Contact: HHS Press Office**
December 7, 2021 **202-690-6343**
media@hhs.gov

U.S. Surgeon General Issues Advisory on Youth Mental Health Crisis Further Exposed by COVID-19 Pandemic


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Opinion

Why Are Young Americans Killing Themselves?

Suicide is now their second-leading cause of death.




By Richard A. Friedman
Dr. Friedman is a psychiatrist. Jan 6, 2020

Teenagers and young adults in the United States are being ravaged by a mental health crisis – and we are doing nothing about it. As of 2017, statistics show that an alarming number of them are suffering from depression and dying by suicide. In fact, suicide is now the second leading cause of death among young people, surpassed only by accidents.

After declining for nearly two decades, the suicide rate among Americans ages 10 to 24 jumped 56 percent between 2007 and 2017, according to data from the Centers for Disease Control and Prevention. And for the first time the gender gap in suicide has narrowed: Though the numbers of suicides are greater in males, the rates of suicide for female youths increased by 12.7 percent each year, compared with 7.1 percent for male youths.


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At the same time, the rate of teen depression shot up 63 percent, an alarming but not surprising trend given the link between suicide and depression: In 2017, 13 percent of teens reported at least one episode of depression in the past year, compared with 8 percent of teens in 2007, according to the National Survey on Drug Use and Health.

How is it possible that so many of our young people are suffering from depression and killing themselves when we know perfectly well how to treat this illness? If thousands of teens were dying from a new infectious disease or a heart ailment, there would be a public outcry and a national call to action.

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10 Leading Causes of Death by Age Group, United States – 2014

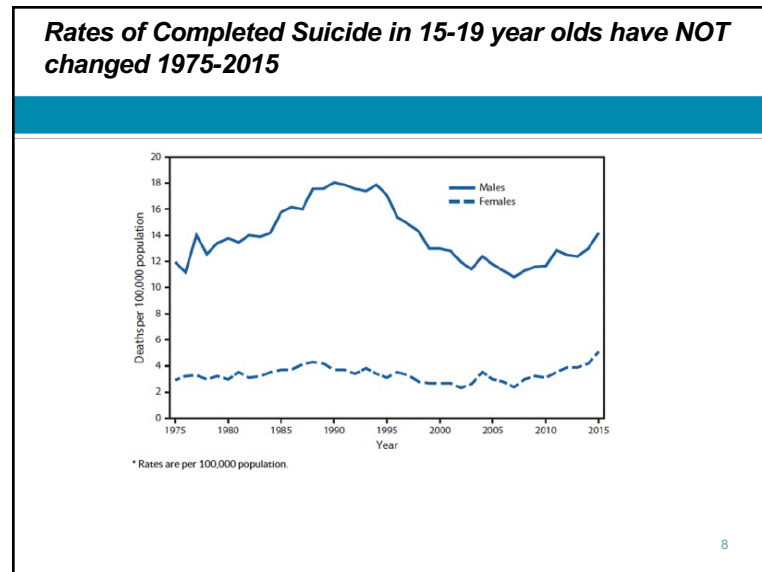
Rank	Age Groups										Total
	<1	1-4	5-9	10-14	15-24	25-34	35-44	45-54	55-64	65+	
1	Congenital Anomalies 4,746	Unintentional Injury 1,216	Unintentional Injury 730	Unintentional Injury 750	Unintentional Injury 11,836	Unintentional Injury 17,267	Unintentional Injury 16,048	Malignant Neoplasms 44,834	Malignant Neoplasms 115,282	Heart Disease 489,722	Heart Disease 614,348
2	Short Gestation 4,173	Congenital Anomalies 399	Malignant Neoplasms 436	Suicide 425	Suicide 5,079	Suicide 6,569	Malignant Neoplasms 11,267	Heart Disease 34,791	Heart Disease 74,473	Malignant Neoplasms 413,885	Malignant Neoplasms 591,689
3	Maternal Pregnancy Comp. 1,574	Homicide 364	Congenital Anomalies 192	Malignant Neoplasms 416	Homicide 4,144	Homicide 4,159	Heart Disease 10,368	Unintentional Injury 20,610	Unintentional Injury 18,030	Chronic Low Respiratory Disease 124,693	Chronic Low Respiratory Disease 147,101
4	SIDS 1,545	Malignant Neoplasms 321	Homicide 123	Congenital Anomalies 156	Malignant Neoplasms 1,569	Malignant Neoplasms 3,624	Suicide 6,706	Suicide 8,767	Chronic Low Respiratory Disease 16,482	Cerebrovascular 113,308	Unintentional Injury 136,053
5	Unintentional Injury 1,161	Heart Disease 149	Heart Disease 69	Homicide 156	Heart Disease 953	Heart Disease 3,341	Homicide 2,588	Liver Disease 8,627	Diabetes Mellitus 13,342	Alzheimer's Disease 92,604	Cerebrovascular 133,163
6	Placenta Cord. Membranes 955	Influenza & Pneumonia 109	Chronic Low Respiratory Disease 68	Heart Disease 122	Congenital Anomalies 377	Liver Disease 725	Liver Disease 2,582	Diabetes Mellitus 6,062	Liver Disease 12,792	Diabetes Mellitus 54,161	Alzheimer's Disease 93,541
7	Bacterial Sepsis 544	Chronic Low Respiratory Disease 53	Influenza & Pneumonia 57	Chronic Low Respiratory Disease 71	Influenza & Pneumonia 199	Diabetes Mellitus 709	Diabetes Mellitus 1,999	Cerebrovascular 11,727	Cerebrovascular 11,727	Unintentional Injury 42,226	Diabetes Mellitus 76,488
8	Respiratory Disease 450	Septicemia 53	Cerebrovascular 45	Cerebrovascular 43	Diabetes Mellitus 181	HIV 583	Cerebrovascular 1,745	Chronic Low Respiratory Disease 4,402	Suicide 7,527	Influenza & Pneumonia 44,836	Influenza & Pneumonia 55,227
9	Circulatory System Disease 444	Benign Neoplasms 38	Benign Neoplasms 36	Influenza & Pneumonia 41	Chronic Low Respiratory Disease 178	Cerebrovascular 579	HIV 1,174	Influenza & Pneumonia 2,731	Septicemia 5,709	Nephritis 39,957	Nephritis 48,146
10	Neonatal Hemorrhage 441	Perinatal Period 38	Septicemia 33	Benign Neoplasms 38	Cerebrovascular 177	Influenza & Pneumonia 549	Influenza & Pneumonia 1,125	Septicemia 2,514	Influenza & Pneumonia 5,390	Septicemia 29,124	Suicide 42,773

Data Source: NCHS
Produced by: NCHS

Suicide=2nd leading cause of death 10-34yo

 **Centers for Disease Control and Prevention**
National Center for Injury Prevention and Control

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Completed Suicide: The Tip of the Iceberg

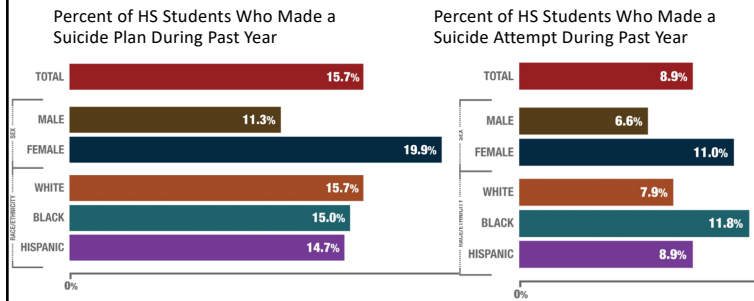
- **Suicide 2nd leading cause of death 10-33yo**
- Past year HS students (2019 CDC YRBS):
- 18.8% serious SI
- 15.7% made suicide plan
- 8.9% made suicide attempt (SA)
- 2.5% sought medical attention for suicide attempt (SA)



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CDC Youth Risk Behavior Surveillance (YRBS) 2019 Shows High Rates of Suicidality Among High School (HS) Students



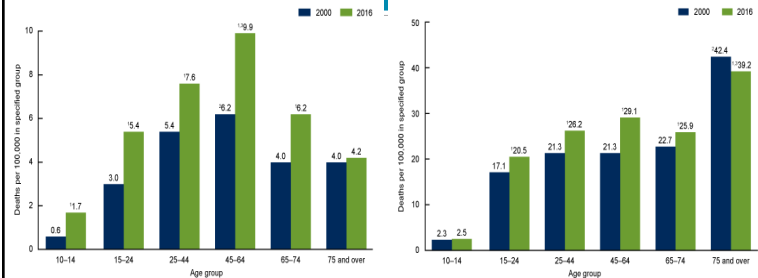
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Increase in completed suicide 2000-2016 by age



Source: Stone DM MMWR CDC 06/08/18



Suicide rates ↑30% >50% of US States since 1999
>54% who died by suicide had NO known mental health disorder

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NSSI: Non-Suicidal Self-Injury




“deliberate destruction of one’s body in without intent to die”

- Self-cutting, also erasing, scratching, burning
- Arms, thighs, stomach
- “Suicidal gesture”: outdated term
- Not clear that there are sex differences
- No SES or ethno-racial differences
- Growing problem:
 - 7-45% of adolescents overall
 - 25-45% of children seen in the ED for self-harm
 - Some data suggests it is a growing problem





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Relationship between NSSI & Suicide 

- NSSI: by definition no intent to die
- But...a risk factor for suicide attempt:
 - TORDIA baseline NSSI predicts future SA *better than baseline hx of SA* (HR=7.31 p<0.001; Asarnow 2011)
 - Baseline NSSI predicted future SA among teens *despite controlling for past SA* (OR=7.5, p=0.009, Cox 2012)
 - History of NSSI \uparrow x7 risk for SA in n=399 high school students *despite controlling for prior depression, SAs, and gender* (Guan 2012)
- Problem: Insufficient understanding of the mechanisms of NSSI & suicide

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NIMH TOOLKIT

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Suicide Risk Screening Tool

Ask Suicide-Screening Questions

Ask the patient:

1. In the past few weeks, have you wished you were dead? Yes No
2. In the past few weeks, have you felt that you or your family would be better off if you were dead? Yes No
3. In the past week, have you been having thoughts about killing yourself? Yes No
4. Have you ever tried to kill yourself? Yes No

If yes, how? _____

When? _____

If the patient answers Yes to any of the above, ask the following acuity question:


5. Are you having thoughts of killing yourself right now? Yes No

If yes, please describe: _____

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NIMH Suicide Screening Tools

...but what about access to quality child psychiatric services...especially affordable outpatient care?



Brief Suicide Safety Assessment

Ask Suicide-Screening Questions


What to do when a pediatric patient screens positive for suicide risk:

- Use of the ASQ (10-24 years) screens positive for suicide risk on the ASQ
- Assessment guide for mental health clinicians, ADs, NPs, or PAs
- Provider has collaborative disposition

- 1 Praise patient** for discussing their thoughts
"It's here to follow up on your responses to the suicide risk screening questions. These are hard things to talk about. Thank you for telling us. I need to ask you a few more questions."
- 2 Assess the patient** if possible, assess patient alone (with clinician present if necessary)
Review patient's responses from the ASQ
Frequency of suicidal thoughts
Determine if questions often or generally have a "no" or "not" response.
Ask the patient: "In the past few weeks, have you been thinking about killing yourself?" If yes, ask: "How often?" (once or twice a day, several times a day, a couple times a week, etc.)
"Are you having thoughts of killing yourself right now?"
If "yes," patient requires an urgent/STAT mental health evaluation and contact to be left alone. A positive response indicates immediate risk.
Suicide plan
Assess if the patient has a suicide plan, regardless of how they responded to any other questions (ask about method and access to means). Ask the patient: "Do you have a plan to kill yourself? Please describe." If no plan, ask: "If you were going to kill yourself, how would you do it?"
Note: If the patient has a very detailed plan, this is more concerning than if they haven't thought it through in great detail. If the plan is feasible (e.g., pills or something they can get access to pills), this is a reason for greater concern and removing or securing dangerous items (medication, guns, ropes, etc.)
Past behavior (Strongest predictor of future attempt)
Evaluate past self-harm and history of suicide attempts (method, estimated date, intent). Ask the patient: "Have you ever tried to hurt yourself?" Have you ever tried to kill yourself?" If yes, ask: "How? When? Why?" and assess intent: "Did you think [method] could kill you?" "Did you want to die?" (For youth, assess as retrospective activity if needed). Ask: "Did you receive medical/psychiatric treatment?"
Symptoms
Depression: "In the past few weeks, have you felt so sad or depressed that it makes it hard to do the things you would like to do that you feel constantly exhausted?"
Anxiety: "In the past few weeks, have you felt so worried that it makes it hard to do the things you would like to do that you feel constantly agitated/on-edge?"
Impulsivity/Recklessness: "Do you often act without thinking?"
Hopellessness: "In the past few weeks, have you felt hopeless, like things would never get better?"
Intoxication: "In the past few weeks, have you been feeling more irritable or grayer than usual?"
Substance and alcohol use: "In the past few weeks, have you used drugs or alcohol?" If yes, ask: "What? How much?"
Other concerns: "Recently, have there been any concerning changes in how you are thinking or feeling?"
Support & Safety
Support network: "Is there a trusted adult you can talk to? Who? Have you ever seen a therapist/counselor?" If yes, ask: "When?"
Safety question: "Do you think you need help to keep yourself safe?" (A "no" response does not indicate that the patient is safe. Ask a "yes" is a reason to act immediately to ensure safety.)
Reasons for asking: "What are some of the reasons you would NOT tell yourself?"
- 3 Interview patient and patient/guardian together**
"If patient is 18, ask patient's permission for parent to be present."
"Stay to the patient: "After speaking with your child, I have some concerns about his/her safety. We are going to check up on this. It can be a difficult topic to talk about. We would love to get your perspective."
• "Your child said (reference positive responses on the ASQ). Is this something he/she shared with you?"
• "Does your child have a history of suicidal thoughts or behaviors that you're aware of?"
If yes, ask: "Please explain."
• "Does your child seem sad or depressed?"
• "What about? Are you? (reference) 'hopeless' or 'irritable' feelings?"
• "Are you comfortable keeping your child safe at home?"
• "Have there been any recent or remote potentially dangerous items (guns, medications, ropes, etc.)?"
• "Are there anything you would like to tell me?"
- 4 Determine disposition**
After completing the assessment, choose the appropriate disposition.
□ Emergency psychiatric evaluation: Patient at immediate risk for suicide (document suicidal thoughts, urgency of proper psychiatric help, patient care in ED)
□ Further evaluation of risk is necessary (request full mental health history evaluation in the ED)
□ No further evaluation in the ED: Create safety plan for managing potential suicidal thoughts and discuss securing or removing potentially dangerous items (medication, guns, ropes, etc.)
□ Send home with mental health referral or
□ No further intervention is necessary at this time
- 5 Provide resources to all patients**
 - 24/7 National Suicide Prevention Lifeline: 1-800-273-TALK (8255)
 - Es: Español: 1-888-628-9454
 - 24/7 Crisis Text Line: Text "NIMH" to 726-7424

ASQ Suicide Risk Screening Toolkit | NATIONAL INSTITUTE OF MENTAL HEALTH (NIMH) | 10/2018


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Self-Cutting: What can we do now? 

- Ask....don't assume:
 - *Have you ever cut yourself on purpose?*
 - *When?*
 - *Why?*
- Assess for suicide (which may be separate prob)
- Don't reflexively send them to the ER (if possible depending on your setting)
- Don't reflexively assume this is a personality disorder
- Substitution: Ice bath? Etc.

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Parent-Adolescent Agreement About Adolescents' Suicidal Thoughts 

Jason D. Jones, PhD,^a Rhonda C. Boyd, PhD,^{a,b} Monica E. Calkins, PhD,^b Annisa Ahmed, BA,^a Tyler M. Moore, PhD,^a Ran Barzilay, MD, PhD,^{a,b} Tami D. Benton, MD,^a Raquel E. Gur, MD, PhD^a

Pediatrics 2019 abstract

OBJECTIVES: To examine agreement between parent and adolescent reports of adolescents' suicidal thoughts and explore demographic and clinical factors associated with agreement in a large community sample.

METHODS: Participants included 5137 adolescents 11 to 17 years old (52.1% girls; 43.0% racial minority) and a collateral informant (97.2% parent or stepparent) from the Philadelphia Neurodevelopmental Cohort. Families were recruited from a large pediatric health care network. Adolescents and parents completed a clinical interview that included questions about adolescents' lifetime suicidal thoughts.

RESULTS: Agreement was moderate for thoughts of killing self ($\kappa = 0.466$) and low for thoughts of death or dying ($\kappa = 0.171$). Discrepancies stemmed from both parental unawareness of suicidal thoughts reported by adolescents and adolescent denial of suicidal thoughts reported by parents. Fifty percent of parents were unaware of adolescents' thoughts of killing themselves, and 75.6% of parents were unaware of adolescents' recurrent thoughts of death. Forty-eight percent of adolescents denied thoughts of killing themselves, and 67.5% of adolescents denied thoughts of death reported by parents. Several demographic (eg, age) and clinical (eg, treatment history) characteristics were associated with agreement.

CONCLUSIONS: Early identification and intervention hinge on reliable and valid assessment of suicide risk. The high prevalence of parental unawareness and adolescent denial of suicidal thoughts found in this study suggests that many adolescents at risk for suicide may go undetected. These findings have important clinical implications for pediatric settings, including the need for a multi-informant approach to suicide screening and a personalized approach to assessment based on empirically derived risk factors for unawareness and denial.

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What can we do NOW? Make a safety plan



JAMA Psychiatry | Original Investigation

Comparison of the Safety Planning Intervention With Follow-up vs Usual Care of Suicidal Patients Treated in the Emergency Department JAMA Psychiatry 2018

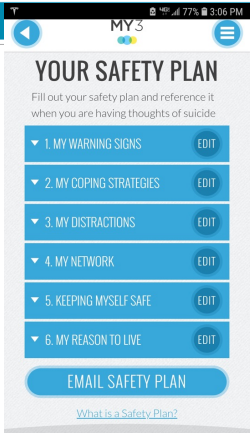
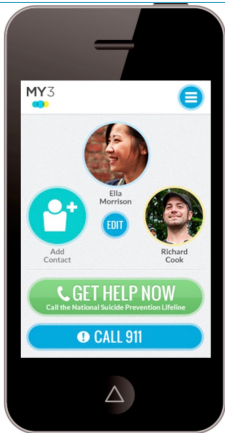
Barbara Stanley, PhD; Gregory K. Brown, PhD; Lisa A. Brenner, PhD; Hanga C. Gallafly, PhD; Glenn W. Currier, MD; Kerry L. Knox, PhD; Saida R. Chaudhury, PhD; Ashley L. Bush, MPA; Kelly L. Green, PhD

- Adults in 9 Eds 2010-2015 n=1640 pts
- Safety plan=prioritized list of coping strategies & skills vs. Tx As Usual (TAU)
- Safety plan group=
 - ↓suicidal behavior (3.03% vs. 5.29% TAU--> 45% fewer suicidal behaviors during 6 month follow up)
 - Double rate of keeping at least 1 outpatient follow up (OR 2.06)

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Make a Safety Plan: www.mysafetyplan.org




<https://www.mysafetyplan.org>

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National Suicide & Crisis Lifeline:
Call 988 or Visit www.988lifeline.org



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988 LIFELINE
GET HELP LEARN GET INVOLVED PROVIDERS & PROFESSIONALS
En Español For Deaf & Hard of Hearing

ANUNCIO ESPECIAL
Los servicios de texto y chat de 988 Lifeline ya están disponibles en español! Haga clic aquí para obtener información sobre cómo acceder a todos los servicios en español.
CONOZCER MÁS

The 988 Lifeline is a national network of local crisis centers that provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week in the United States. We're committed to improving crisis services and advancing suicide prevention by empowering individuals, advancing professional best practices, and building awareness.

ABOUT THE LIFELINE


Anyone could be struggling with suicide. Find more specific resources below.

<p>ALUMNOS DE LA LIFELINE</p> <p>The Lifeline and 988</p>	<p>ALUMNOS DE LA LIFELINE</p> <p>Coping During Community Unrest</p>	<p>ALUMNOS DE LA LIFELINE</p> <p>Emotional Wellbeing During COVID-19</p>	<p>ALUMNOS DE LA LIFELINE</p> <p>Individuals with Neurodivergence</p>
<p>Black Mental Health</p>	<p>Maternal Mental Health</p>	<p>Youth</p>	<p>Disaster Survivors</p>
<p>Native American, Indian, Indigenous, & Alaska Natives</p>	<p>Veterans</p>	<p>Loss Survivors</p>	<p>LGBTQ+</p>
<p>Attempt Survivors</p>	<p>Deaf, Hard of Hearing, Hearing Loss</p>		

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National Suicide & Crisis Lifeline:
Call 988 or Visit www.988lifeline.org



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988 LIFELINE
GET HELP LEARN GET INVOLVED PROVIDERS & PROFESSIONALS
En Español For Deaf & Hard of Hearing

Youth

Suicide is the second leading cause of death for young people between 10 to 24. Sometimes it feels as though your struggle is being underestimated by your age. But we hear you, and help is available.

How To Take Care Of Yourself

Ask for help. Don't be afraid to reach out to friends and trusted adults in your life for support. You can also call the 988 Suicide & Crisis Lifeline any time – calls are confidential.


Make a safety plan. A safety plan can help guide you through difficult moments and keep you safe. Having a [template on hand](https://www.mysafetyplan.org/) with an established plan may be helpful, or you can get help and guidance at <https://www.mysafetyplan.org/>.



Family conflicts, relationship hardships, school pressures, and discovering your identity can feel overwhelming and impossible to deal with alone. Losing relationships and important people in our lives can also feel overwhelming. Seeking out support can make these changes manageable.

Love and friendship are all about respect. Toxic or unhealthy relationships can negatively affect you. Whether you're dating or building new friendships, [remember your rights](#). If you're being bullied, [help is also available](#).

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MCPAP: Massachusetts Child Psychiatry Access Program (MCPAP.com) 

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Connecting Primary Care with Child Psychiatry

MCPAP About MCPAP




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ENROLL NOW »

MCPAP Diagnostic Resources



USE NOW »

SWYC Version Includes PPD Screen




ACCESS TOOL HERE »

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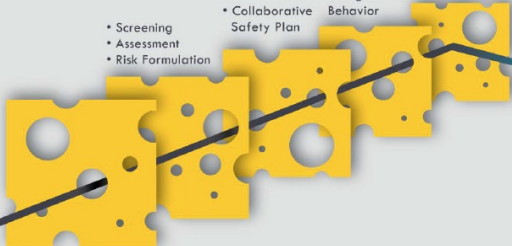
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ZEROSuicide
IN HEALTH AND BEHAVIORAL HEALTH CARE A FOCUS ON PATIENT SAFETY AND ERROR REDUCTION

THE TOOLS OF ZERO SUICIDE FILL THE GAPS



SUICIDAL PERSON



Avoid Serious Injury or Death

- Screening
- Assessment
- Risk Formulation
- Collaborative Safety Plan
- Treat Suicidal Thoughts and Behavior
- Continuity of Care

Adapted from James Reason's "Swiss Cheese" Model Of Accidents

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Oregon Zero Suicide Plan 2014


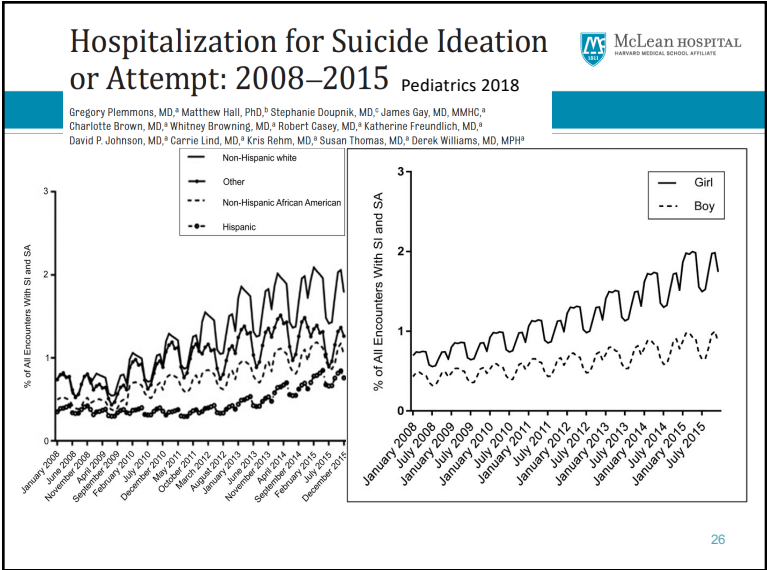
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Table 1. Social and ecological levels of influence on suicide, suicide risk factors and examples of recommended interventions in this plan for preventing suicide among youth aged 10–24 years

Social-ecological level of influence	Suicide risk factors associated with the level of influence	Sample of recommended interventions from the plan
Individual	<ul style="list-style-type: none"> Mental illness Substance use disorder Previous suicide attempt Impulsivity/aggressiveness 	<ul style="list-style-type: none"> Enhancing coping and problem-solving skills Assisting individuals at risk to identify reasons for living Providing timely, appropriate and quality mental and behavioral health care Best practice suicide risk assessments, policies and protocols and a workforce trained to administer them
Relationship	<ul style="list-style-type: none"> High conflict or violent relationships (including bullying) Family history of suicide Lack of positive peer, family or other relationships with adults 	<ul style="list-style-type: none"> Connectedness to individuals, family, community and social institutions (e.g., schools) Supportive relationships with family and peers Supportive relationships with trained physical/behavioral health providers
Community	<ul style="list-style-type: none"> Few available sources of supportive relationships Barriers to health or behavioral health care (e.g., lack of access to providers or medications, prejudice and stigma, etc.) 	<ul style="list-style-type: none"> Safe and supportive school and community environments Access to continued best practice care after inpatient or psychiatric hospitalizations and emergent/urgent care
Societal	<ul style="list-style-type: none"> Lack of resources for physical and behavioral health providers Unaddressed barriers to care after emergency intervention Legal barriers to family involvement in their children's mental health care Insufficient availability of peer supports for at-risk youth 	<ul style="list-style-type: none"> Access to timely behavioral health services Integrated physical and behavioral health care Continuity of care across systems Education of providers on the benefits of family involvement Development of widespread family/peer support specialists

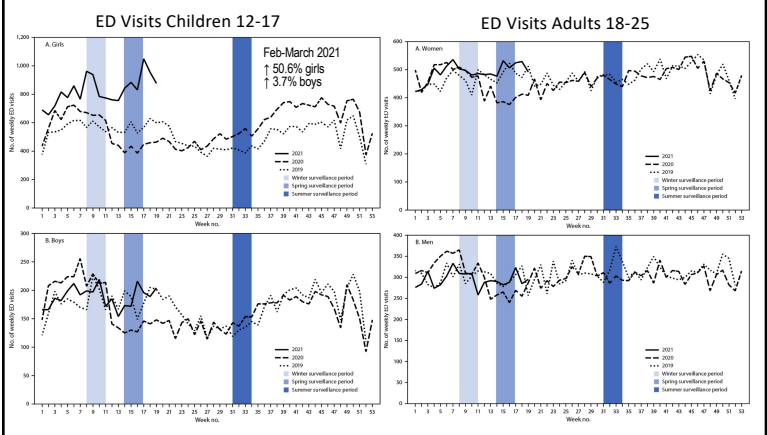
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COVID Does Not Universally Increase ED Visits For Suicide (Yard E. MMWR 2021)



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- (2) What can be done to address youth suicide now?
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Nat'l Council Suicide Prevention & Nat'l Institute of Mental Health 2014

A Prioritized Research Agenda for Suicide Prevention: An Action Plan to Save Lives

Research Prioritization Task Force

www.suicide-research-agenda.org



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- Reduce suicide attempts & suicide completions by 20% in 5 yrs & >40% in 10 yrs

- 1) Why do people become suicidal?
- 2) How can we better detect/predict risk?
- 3) What interventions or preventions are effective?
- 4) What services are most effective for treating suicidal behavior?
- 5) What non-health care centered preventions/interventions work?
- 6) What new & existing research infrastructure is needed to reduce suicidal behavior?

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Risk Factors for Suicidal Thoughts & Behaviors: A Meta-analysis of 50 Years of Research (Franklin JC Psychol Bull 2017)

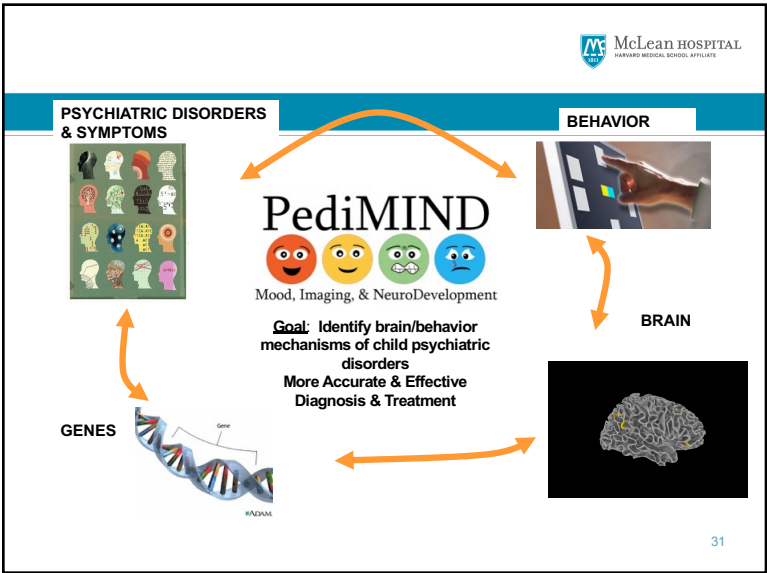


Top 5 Broad Risk Factor Categories in terms of popularity								
Rank	Pre-1985		1985-1994		1995-2004		2005-2014	
	Category	% ES	Category	% ES	Category	% ES	Category	% ES
1	Demographics	29.73	Internalizing	29.89	Internalizing	28.26	Internalizing	22.81
2	Internalizing	14.86	Prior STBs	13.88	Externalizing	14.67	Demographics	19.14
3	Prior STBs	10.81	Demographics	11.03	Prior STBs	11.85	Externalizing	16.02
4	Externalizing	9.46	Externalizing	10.68	Demographics	11.85	Prior STBs	11.52
5	Social Factors	5.41	Social Factors	9.25	Social Factors	8.37	Social Factors	9.61
Total		70.27		74.73		75.00		79.10

Take home: 50 yrs of research → Same 5 factors → Prediction little better than chance

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Mechanisms Matter: A tale of 2 children...

Jack 5yo fatigue, fever, joint pain, swollen belly, bruising


- Exam: hepatosplenomegaly, pale
- CBC: WBC 3.7 (32% neut 10% blast), Hgb 9.8 PLT 172
- Symptoms + bio-marker =specific early diagnosis =mechanism-targeted treatment
- =better prognosis/outcome

US childhood (<20yo) mortality trends for lymphoma and leukemia, & Other Cancers

APC=Annual Percent Change
Smith M A et al. J Clinical Oncology 2010;28:2625-2634

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Mechanisms Matter: A tale of 2 children... 

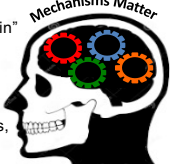
<p>Riley 8yo "very moody"</p> <ul style="list-style-type: none"> • Irritable/angry/destructive • Sad/sullen/wants to die • Hyper/silly/goofy • Therapy at 4 for anger and not following directions • Treatment at 6 for anxiety with SSRI + therapy led to hospitalization for out of control behavior. 	<p>Test to determine what diagnosis(es)?</p> <ul style="list-style-type: none"> ...treatment? ...prognosis? ...risk for suicide? ...need for ER evaluation? ...need for inpatient psychiatric hospitalization?
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What can we NOW to make the FUTURE brighter? 
 PediMIND Program Research (www.PEDIMIND.org)

- Following the example of childhood leukemia—where better understanding of biological mechanisms has transformed childhood leukemia from fatal for all kids, to now 5-year survival over 95%
- PediMIND Program seeks to improve our understanding of brain/behavior mechanisms underlying youth suicide, non-suicidal self-injury (NSSI, ie self-cutting), and irritability—that could ultimately improve how we diagnose and treat these most important child mental health issues.
- **Mechanisms matter:**
 - 1) Mechanism-based prediction of NSSI and suicide
 - 2) Mechanism-based treatment for NSSI and suicide
 - 3) Computer assisted cognitive remediation—aka "retraining the brain"
 - 4) Targeted/novel medications
 - 5) Improved/targeted therapy
- PediMIND program values partnership with clinicians (nurses, SW, MDs, PhDs), families, teachers/schools/school counselors, community organizations, & funders.



PediMIND.org

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SA vs. NSSI: Dogma & Data



- Similar theoretical models for youth suicide and NSSI:
 1. Inter-personal stress vs. intra-psycho conflict
 2. Emotion generation/recognition
 3. "Cold cognition": decision-making, reward, impulsivity
 4. "Emotion regulation" as final common pathway
- Few studies of NSSI-only vs. SA-only youths
- Few studies of brain/behavioral mechanisms underlying use these theories



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Photo source: <http://www.asiaone.com/a1media/health/03Mar08/images/self-cutting-runny-edit.jpg>

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NSSI-only vs. SA-only vs. TDC Youths



Participants:

- 1) NSSI-only: cutting in the past month with more than 5 lifetime episodes, no SA
 - 2) SA-only: suicide attempt in the past month, no NSSI
 - 3) HC: no mental health history in themselves or 1st degree relatives
- IQ >70; English fluency in the teenage participant


Outcomes:

- Psychopathology/demographics
- Behavioral task performance

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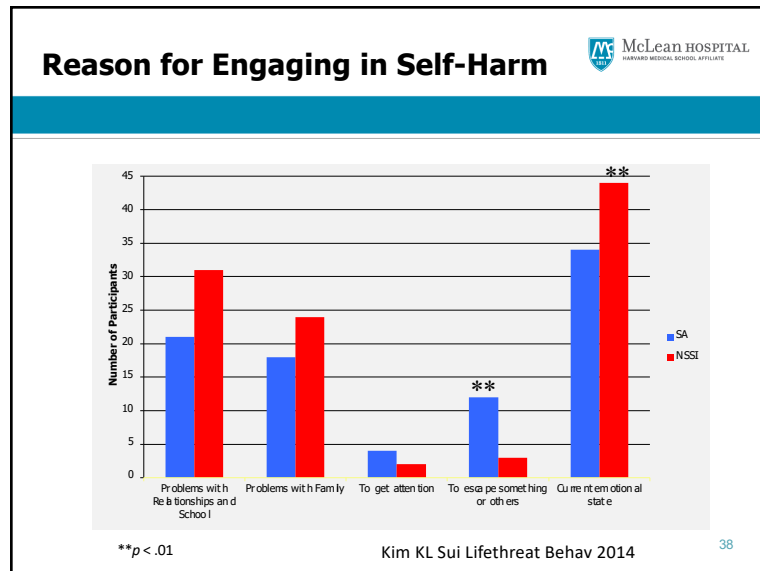
Sample Demographics


McLean HOSPITAL
HARVARD MEDICAL SCHOOL AFFILIATE

	NSSI (n=45)	SA (n=45)	
Age in Years (SD)	14.9±1.3	15.3±1.3	t(88)=-1.48, p=0.14
Females (n, %)	38 (84%)	28 (62%)	χ ² =5.68, p=0.02
Males	7 (16%)	17 (38%)	
SI Onset	12.4 y/o	13.8 y/o	p < 0.01
Onset of Self-Injurious Behavior (NSSI or SA)	13.2±1.8	14.8±1.4	F(1,84)=15.40 p<0.01
BSS Current SI	13.21±8.07	10.68±7.91	F(1,85)=2.17 p=0.14
Medications			
None	6 (13)	17 (38)**	*p < .05; **p < .01
SSRI	34 (76)	23 (51)*	
Sedatives	4 (9)	0 (0)*	

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Prisoner's Dilemma Task: Peer Acceptance & Rejection



- Simulates social situations using reciprocal economic exchange
- (In English): Players win money depending on whether they and the other player decide to cooperate or not cooperate ("defect")
- Each player's decision is revealed after every round
- Allows examination of players':
 - (a) Play (do they cooperate/work together vs. defect/reject peer)

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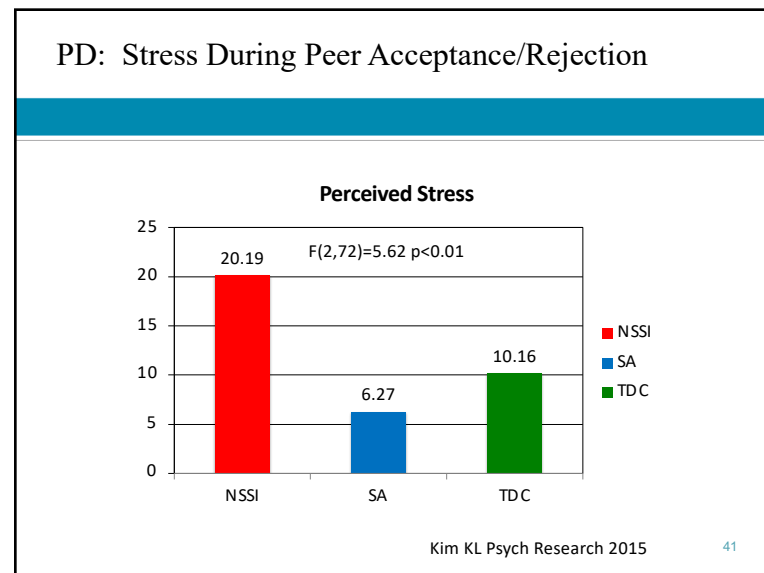
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Peer Acceptance vs Rejection



	Player Earns	Co-Player Earns
If both cooperate	\$2	\$2
If both don't cooperate	\$1	\$1
If player does, but co-player doesn't	\$0	\$3
If co-player does, but player doesn't	\$3	\$0

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Mechanisms Matter: Youth Suicide & Non-Suicidal Self-Injury

PediMIND Solution: Define brain mechanisms of SA vs. NSSI

Unconscious Attitudes towards Suicide & NSSI:
Self-Injury Implicit Association Task

cutting
me

not cutting
not me

life
me

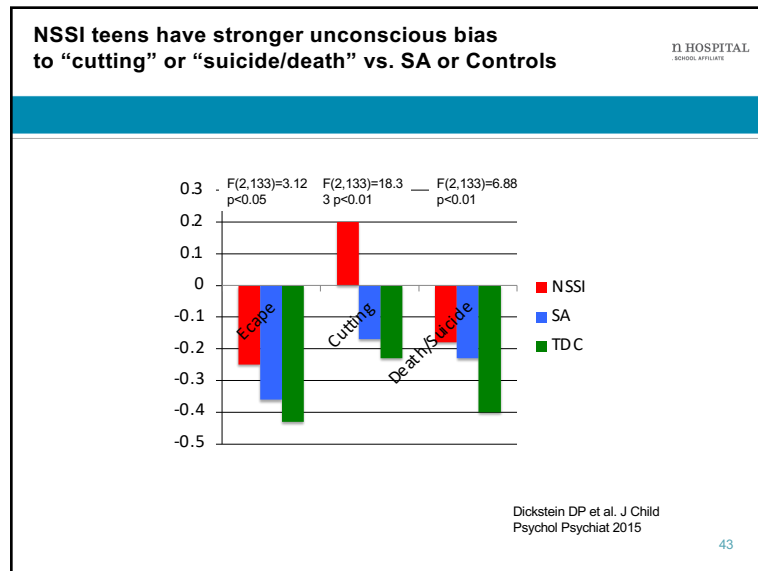
suicide
not me

overdose

Bias To Something=Faster reaction time classifying center object when top category paired with "me" (than when paired with "not me") if I have thought about center object before

Nock et. al, 2007, 2012 42

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Summary: NSSI vs. Suicide Attempters

McLEAN HOSPITAL
HARVARD MEDICAL SCHOOL AFFILIATE

- NSSI is a serious problem associated with
 - Earlier onset of self-harm behavior
 - Greater implicit association with cutting & death/suicide (SI-IAT)
 - Greater self-reported stress during inter-personal collaboration/conflict (Prisoner’s Dilemma)
- *Why haven’t these NSSI-only youths tried to kill themselves (yet)?*
- *What is the neural mechanism underlying NSSI-only/itself?*
- *What is the mechanism NSSI-only → 1st suicide attempt (vs. continuing with NSSI-only or remitting)?*

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R01MH110379 Non-suicidal Self-Injury in Children:  McLean HOSPITAL
HARVARD MEDICAL SCHOOL AFFILIATE
Brain Behavior Mechanisms & Risk for Suicidal Behavior

10-17 year olds who EITHER cut themselves but have not made a suicide attempt OR controls with no mental health problems themselves or their parents

-Detailed multi-informant assessments (interviews, questionnaires, and smart phone app)

-MRI brain scan & special computer games to define mechanisms of peer acceptance/rejection & implicit attitudes about suicide/NSSI

-Brief follow ups at 3, 6, 9, 12, 15, & 18 months

-\$680/family

- 1) *What brain/behavior mechanisms differentiate 11-16yo's engaged in NSSI vs. control youth?*
- 2) *Which mechanisms predict subsequent 1st-onset suicide attempt (18 months of follow up)?*



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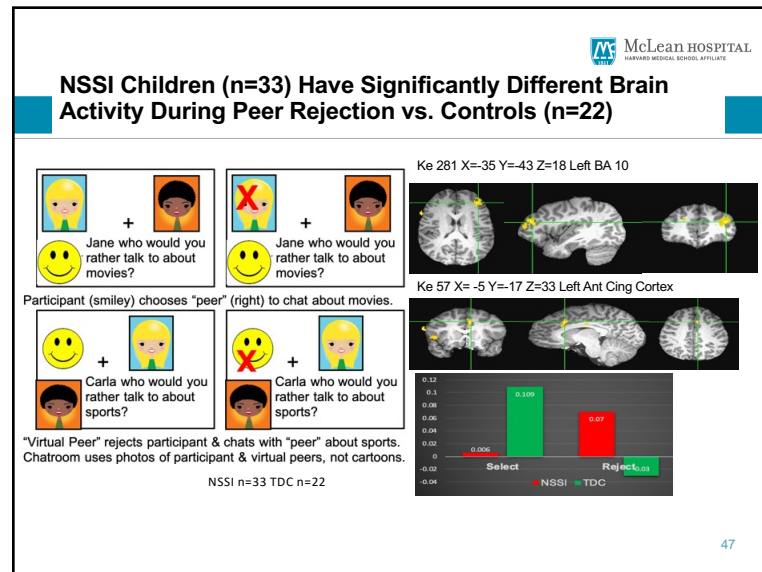
McLean Imaging Center (MIC)  McLean HOSPITAL
HARVARD MEDICAL SCHOOL AFFILIATE

- 3Tesla Siemens Prisma MRI system
- 64-channel receivers
 - FDA minimal risk
- MRI simulator to desensitize subjects to MRI
- All subjects complete screener pre-enter MRI
- Speakers+microphone so we can talk between scans
- Screen so kids can see our “games”
- Subjects respond by button press

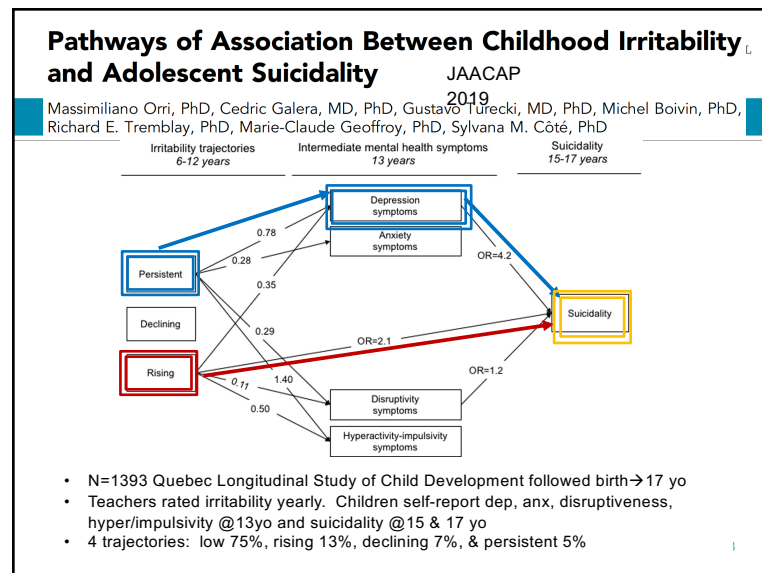


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Charles H. Hood Foundation Major Grant 2020
Brain Mechanisms Underlying Irritability & Suicide



10-14 year olds who EITHER have attempted suicide OR controls

- Detailed multi-informant assessments (interviews, questionnaires, and smart phone app)
- MRI brain scan & special computer games to define mechanisms of peer acceptance/rejection & implicit attitudes about suicide/NSSI
- Brief follow ups at 3 & 6 months
- \$310/family

- 1) *What are brain/behavior mechanisms underlying youth suicide & irritability?*
- 2) *Which mechanisms predict repeat suicide attempt?*



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Summary & Future Directions:



- Suicide and Non-Suicidal Self-Injury (NSSI) are among our most serious forms of mental illness in children and teens—with no single cause, and no single treatment.
- NSSI=self-injury without intent to die (suggesting that not all NSSI youth need the ER/inpatient care). But, it places children at 7x increased risk of a suicide attempt
- Asking about suicide and NSSI does not cause either behavior.
- NSSI is a growing & serious problem associated with
 - Earlier onset of self-harm behavior
 - Greater implicit association with cutting & death/suicide (SI-IAT)
 - Greater self-reported stress during inter-personal collaboration/conflict (Prisoner's Dilemma)
- Critical role of screening & safety planning b/c never enough ED or inpatient beds
- Together, we can make a powerful difference—just like as has been done in childhood cancer—when providers, families, researchers work together—to conduct mechanism-oriented research... for a precision medicine approach to diagnosis, treatment, prediction, & ultimately prevention—of NSSI & suicide.



1-877-626-8140

<https://www.mcleanhospital.org/treatment/youth-programs>



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