Crucial decision: assessing suicidality in clinical practice

Paul Plener
Definition

• **Suicide**: act of intentionally ending one’s own life.

• **Nonfatal suicidal thoughts and behaviors** ("suicidal behaviors"):  
  
  • **suicide ideation**: thoughts of engaging in behavior intended to end one’s life

  • **suicide plan**: formulation of a specific method through which one intends to die

  • **suicide attempt**: engagement in potentially self-injurious behavior in which there is at least some intent to die.
Epidemiology
Trends in youth

OECD Countries: 15-29a: 1990: 8,5→7,4/100.000
Global picture

- Global Burden of Disease Study 2016 (1990-2016)
- N=195 countries
- 2016: 817,000 suicides
- Age adjusted suicide mortality: 32.7%
- Gender: M>F: (15-19y): no s. difference

Naghavi et al., 2019
Age and suicide

Naghavi et al., 2019
Global picture

• Reason for dying #:
  • 4: Eastern Europe
  • 6: Asia (high income)
  • 7: Australasia
  • 10: Central Europe/ USA

• China and India: 44,2% of all suicides in 2016

• Highest suicide rates:
  • Lesotho: 39
  • Lithuania: 31
  • Russia: 30,6
  • Zimbabwe: 27,8

• Largest decrease:
  • China: 64,1%
  • Denmark: 60%
  • Maldives: 59,1%
From thoughts to action

Figure 1. Age-at-onset curves of suicidal behaviors. Values are all 0.0 for children 1 to 4 years of age.

Figure 2. Speed of transition across suicidal behaviors.
Suicide attempts in youth

- N=1,420, GSMS: 9y→16y (7x),
- 19→30y (4x):
  - 16y: 4% suicide attempt
- Suicide attempts predicts suicide attempts in adulthood (after controlling for psychiatric disorders): OR: 6.4
- Suicide attempts: Predictor of anxiety disorders: OR: 2.8

Copeland et al., 2017
Mental health disorders and suicidality

- 10y prospective study (n=3021; 14-24y; EDSP)
- Mental health disorders before suicide attempt
- Incidencerate of SA: 5.5%, mAge: 16.7y
- Highest risk: PTSD, Dysthymia

Miché et al., 2018
Sleep

• Sleeping disorders: predictor for suicidal ideation, attempts and suicide

• 2 prospective studies in youth (n=392, 6504, 3y FU):
  • Sleep disorders predict Suicidal ideation and attempts

• Systematic review (n=10 studies): Sleep disorders: mAge: 13-19, FU: 7d-10y

• Predicting suicidal ideation and attempts (3-5y later): after controlling for mental health disorders. More pronounced in insomnia

Wong et al., 2011, Wong et al., 2012, Goldstein et al., 2008; Kearns et al., Epub2019
Bullying: suicidality

• Victims and bullies: suicidal ideation and attempts↑

• Being bullied at age 13, predicts suicidal ideation (OR: 2.27) and attempts (OR: 3.05) at age 15

• German students (n=647, mAge: 12.8), 14.4% frequently bullied
  • suicidality: OR: 6.1

Brunstein Klomek et al., 2010; 2016; van Geel et al., 2014; Geoffroy et al., 2016; Jantzer et al., 2015; Lereya et al., 2013
HPA-social stress

- N=220 (f) 18m FU
- Blunted Cortisol response in TSST in suicidal adolescents
- Risk of suicide attempt ↑: combination blunted cortisol response + peer stress

Eisenlohr-Moul et al., 2018
Risk factors: suicidality

- Approximately one third of youth with suicidal ideation: suicide attempt
- ALSPAC study (n=4772): 16y
  - Suicidal ideation: 9.6%, suicide attempts: 6.8%

- Risk for suicide attempts (comparison to suicidal ideation):
  - Self-harm in others:
    - family: aOR: 1.95; friends: aOR: 2.61, both: aOR: 5.26
  - Mental health disorder:
    - Depression: aOR: 3.63; Anxiety: aOR: 2.2, Behavioral disorder: aOR: 2.9
  - female
  - Lower IQ
  - Higher impulsivity
  - Lower conscientiousness
  - More adverse life events
  - Less satisfaction with body
  - Hopelessness
  - Smoking, illegal substances

Mars et al., 2019
Methods of self harm and suicide

• Link between five Swedish registries
• Methods of self-harm (10-24y): suicide risk

• „violent“ methods: compared to intoxication HR: 7.8
• F: Cutting: HR: 4.0 and „violent“ methods: 3.9
• M: no influence of methods used
Suicide prediction: C-SSRS

- Columbia-Suicide Severity Scale
- Four constructs:
  - Suicide ideation severity (1-5)
  - Intensity of ideation: frequency, duration, controllability, deterrents, reasons for ideation (1-5)
  - Behavior: actual-, aborted-, interrupted attempts, preparatory behavior, NSSI
  - Lethality: for actual attempts (6 point scale, if: 0 → potential lethality: 3 point scale)
- Lifetime period (worst point ideation) or current ideation
C-SSRS

- Study of adolescent suicide attempters (n=124, 12-18y)
  - Baseline, 6, 12, 18, 24 weeks
  - Worst-point suicide ideation (OR: 1.45, p=0.02) and SA history (OR: 1.34, p=0.02) predicted suicide attempts

- Prospective adult (mAge: 33) psychiatric cohort (n=804), 6m FU
  - Worst point suicide ideation intensity (OR:1.2; p=0.048) and C-SSRS total score (OR: 1.08, p<0.001) predictor for SA and suicide
  - Items: frequency, duration and deterrent: elevated risk
  - Prediction:
    - SI intensity: AUC: 0.62: cut-off: 18.5: sensitivity: 59%, specificity: 57%
    - C-SSRS total score: AUC: 0.65, cut-off. 28.5: sensitivity: 69%, specificity: 54%

Posner et al., 2011; Lindh et al., 2018
Prediction

- Systematic review of prediction: SA/ self-harm in adolescents (10-25y), 11 studies on 10 tools
- FU: 3-18m (n=2554)

- Self-harm
  - SI-IAT: n.s.
  - SITBI: 3m: AOR: 1.82, p=0.002
  - SIQ: 6m: sensitivity: 27.3%, specificity: 99.2%, PPV: 85.7
  - SHQ: 3m: sensitivity: 94.7%, specificity: 34.6%, PPV: 25.4

- Suicide attempts:
  - Ask Suicide Questionnaire: 6m: sensitivity: 95.8%, specificity: 5.8%, PPV: 16.8
  - SIQ-Junior: aHR: 1.23, p=0.003
  - C-SSRS: aOR: 1.15-1.51 for 1 point increase in total score (4 studies)
  - SIQ: n.s.
  - BHS: uHR: 1.51 (p≤0.001) for 5 point increase
  - CDRS-R: uHR 1.29 (p=0.002) for 10 point increase

- Ability to predict: 27%-95%
- “No single tool is suitable for predicting a higher risk of suicide or self-harm in adolescent populations”

Harris et al., 2019
Suicide prediction

- Meta-Analysis n=365 longitudinal studies over last 50 years

- Top 5 Predictors:
  - Suicidal ideation: earlier suicidal ideation, hopelessness, depression, History of CAN, anxiety disorder
  - Suicide attempt: NSSI, earlier suicide attempt, screening instruments, Axis II disorder, earlier psychiatric hospitalization
  - Suicide: earlier suicide attempt, earlier psychiatric hospitalization, earlier suicidal ideation, lowere SES, ACEs

- Prediction: slightly better than chance and not increased in last 50 years
- New methods necessary

Franklin et al., 2017
Big data: prediction

- Dataset: 2 hospitals: 15a, (N=1.728.549: 8,9 Mio. pat.y.)
- Sensitivity: 45%; Specificity: 90%
- Prediction of suicide attempts and suicides: 3.5 years before in almost half of the cases.
- Strongest predictors:
  - Substance misuse and earlier psychiatric disorders
  - Chronic diseases (hepatitis C), Osteomyelitis, injuries

Barak-Corren et al., Am J Psychiatry 2017
Machine learning: Adolescents

- N: 974 youth with suicide attempts, 496 youth with self-harm, 7059 depressive youth, 25,081 controls: hospital

20 Predictors:

- BMI
- Age
- Pain medication (e.g. Ibuprofen)
- NSAID
- SSRI
- MDD
- Episodic affective disorders
- Number of ER admissions
- In- and outpatient psychiatric treatment in the last year
- Intoxication in the last year
- Antipsychotic medication
- Intoxication with pain medication
- Repetitive depressive episodes with psychotic phenomena
- PTSD
- Opioid medication
- Intoxication with psychotropic substances
- ADHD
- Benzodiazepines
- Gender

Walsh et al., 2018
Suicide prediction: fMRI

- Machine learning: neuronal signatures of specific concepts

Motor cortex

Gustatory regions: Insula, Gyrus front. inf.

Parahippocampal area

Parietal area

Just et al., 2017
Suicide prediction: fMRI

- N=17 with suicidal ideation vs. 17 HC
- 30 concepts presented: Suizid, pos./ neg. Affekt
- 6 concepts and 5 brain regions: best differentiation: HC vs. SI (and in SI +/- SA)

- Training of ML Algorithm with 6 concepts:
- Correct identification of 15/17 (SI group) and 16/17 HC (sensitivity = 0.88, specificity = 0.94, PPV = 0.94, NPV = 0.89).
Suicide prediction: fMRI

- Test at an independent sample (n=21):
  - accuracy: 0.87 (p < 0.000002)
  - sensitivity: 0.81; specificity: 0.94; PPV: 0.94; NPV: 0.8

- Brain regions with best discrimination:
  - superior, frontomedial left
  - medial frontal/anterior cingulum
  - mediotemporal right
  - Inferioparietal left
  - Inferiofrontal left

Just et al., 2017
Brave new world?

- Short term prediction: escalation of
  - Emotional stress
  - Social dysfunction (rejection, bullying)
  - Sleep disorders

- Use of: Smartphones, Wearables, smart homes
- Algorithms for pattern recognition

- Emotional stress:
  - Analysing voice
  - Language used (texts, social media)
  - facial expression
  - heart rate
  - choice of music

- Social dysfunction:
  - Online communication
  - Movements (geographic)

- Sleep disorders:
  - Wearables with Actigraphy, Hf, light sensors
First: Relax! There is no way of getting this wrong

• Whether using self-report measures (Gould et al., 2005), nor using personalized interviews (Crawford et al., 2011) will cause harm

• Asking seems to be relieving to those with a lived history (Gould et al., 2005)
SAFE-T
Suicide Assessment Five-step Evaluation and Triage

1. IDENTIFY RISK FACTORS
   Note those that can be modified to reduce risk

2. IDENTIFY PROTECTIVE FACTORS
   Note those that can be enhanced

3. CONDUCT SUICIDE INQUIRY
   Suicidal thoughts, plans, behavior, and intent

4. DETERMINE RISK LEVEL/INTERVENTION
   Determine risk. Choose appropriate intervention to address and reduce risk

5. DOCUMENT
   Assessment of risk, rationale, intervention, and follow-up
Warning Signs of Acute Suicide Risk

IS PATH WARM?

- Ideation
- Substance Abuse
- Purposelessness
- Anxiety
- Trapped
- Hopelessness
- Withdrawal
- Anger
- Recklessness
- Mood Changes
- ? You must ask
### Look for personal risk factors

<table>
<thead>
<tr>
<th>Risk factors</th>
<th>risk↑</th>
</tr>
</thead>
<tbody>
<tr>
<td>age</td>
<td>• ≥15y</td>
</tr>
<tr>
<td>gender</td>
<td>• male</td>
</tr>
<tr>
<td>partnership</td>
<td>• single</td>
</tr>
<tr>
<td>sexual orientation</td>
<td>• Non-heterosexual</td>
</tr>
<tr>
<td>social support</td>
<td>• Low social support</td>
</tr>
</tbody>
</table>
| psychological              | • Rigid thinking (hopelessness)  
• Low stress tolerance  
• Low emotional regulation skills |
| social skills              | • Low coping skills         
• Deficient problem solving skills |
## Risk factors in the family

<table>
<thead>
<tr>
<th>Risk factors</th>
<th>risk↑</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family history of suicide</td>
<td>• Suicide in close relatives</td>
</tr>
<tr>
<td>Family history</td>
<td>• Mental health disorders in close relatives</td>
</tr>
</tbody>
</table>
| Family situation              | • Loss of parent (divorce, death,…)  
|                               | • Severe family conflicts  
|                               | • Inadequate parental support  
|                               | • Frequently moving/ changing homes |

adapted from Chehil & Kutcher, 2012
# Risk factors: mental health

<table>
<thead>
<tr>
<th>Risk factors</th>
<th>risk↑</th>
</tr>
</thead>
<tbody>
<tr>
<td>disorders</td>
<td>• Severe depression/ depression in bipolar disorder</td>
</tr>
<tr>
<td></td>
<td>• Acute psychotic state</td>
</tr>
<tr>
<td></td>
<td>• Substance misuse</td>
</tr>
<tr>
<td></td>
<td>• BPD</td>
</tr>
<tr>
<td></td>
<td>• Schizophrenia</td>
</tr>
<tr>
<td>Psychiatric/ cognitive symptoms</td>
<td>• Hopelessness</td>
</tr>
<tr>
<td></td>
<td>• Low self-esteem</td>
</tr>
<tr>
<td></td>
<td>• Deficient reality control</td>
</tr>
<tr>
<td></td>
<td>• Commanding voices</td>
</tr>
<tr>
<td>Affective symptoms</td>
<td>• Low mood</td>
</tr>
<tr>
<td></td>
<td>• Severe anxiety/ panic attacks</td>
</tr>
<tr>
<td></td>
<td>• Intensive feelings of loneliness</td>
</tr>
<tr>
<td>Behavioral symptoms</td>
<td>• Severe, repetitive NSSI</td>
</tr>
<tr>
<td></td>
<td>• Restlessness, agitation</td>
</tr>
<tr>
<td></td>
<td>• Impulsivity</td>
</tr>
<tr>
<td></td>
<td>• Aggression</td>
</tr>
<tr>
<td></td>
<td>• Alcohol- and drug misuse</td>
</tr>
</tbody>
</table>

Adapted from Chehil & Kutcher, 2012
## Risk factors: stressors

<table>
<thead>
<tr>
<th>Risk factors</th>
<th>risk↑</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stressors</td>
<td>• Financial problems</td>
</tr>
<tr>
<td></td>
<td>• Legal problems</td>
</tr>
<tr>
<td></td>
<td>• Loss of schooling/work</td>
</tr>
<tr>
<td></td>
<td>• Grief (romantic grief)</td>
</tr>
<tr>
<td></td>
<td>• Bullying</td>
</tr>
<tr>
<td></td>
<td>• Social rejection</td>
</tr>
<tr>
<td>Medical history</td>
<td>• Severe sleeping disorder</td>
</tr>
<tr>
<td></td>
<td>• Chronic pain</td>
</tr>
<tr>
<td></td>
<td>• Physical impairment</td>
</tr>
<tr>
<td></td>
<td>• Cognitive impairment</td>
</tr>
<tr>
<td></td>
<td>• Loss of sight or hearing</td>
</tr>
<tr>
<td></td>
<td>• Mutilations</td>
</tr>
<tr>
<td></td>
<td>• Feelings of being a burden to others</td>
</tr>
<tr>
<td>CAN</td>
<td>• History of CAN</td>
</tr>
</tbody>
</table>

adapted from Chehil & Kutcher, 2012
Assess media use

• Increase in google searches since start

• 95% pediatric ERs (n=14): increase in admissions for suicidality in comparison to the year before
  • In 40%: copy suicide attempts 30 days after series started

• Suicidality in US ERs: 2012-2017: sign. Increase since March 2017

• 29% increase in suicide rate in April 2017 in the age group 10-17y

• April 2017: highest suicide rate in 5 years in the US in adolescents: since December 2017 increase in suicide: + 195 cases

• Not in higher age groups, increase also in males

Ayers et al., 2017; Feuer & Havens, 2017; Cooper et al., 2017; 2018, Bridge et al., 2019
## Current and past suicidality

<table>
<thead>
<tr>
<th>Risk factors</th>
<th>risk↑</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suicidal ideation</td>
<td>• Persistent, over a long time</td>
</tr>
<tr>
<td></td>
<td>• Intensive, very recent</td>
</tr>
<tr>
<td></td>
<td>• Uncontrollable</td>
</tr>
<tr>
<td>Suicidal intention</td>
<td>• Strong wish to die</td>
</tr>
<tr>
<td></td>
<td>• Strong will to take action</td>
</tr>
<tr>
<td></td>
<td>• Expecting death</td>
</tr>
<tr>
<td>Suicide plans</td>
<td>• Well planned</td>
</tr>
<tr>
<td></td>
<td>• Method with high potential lethality</td>
</tr>
<tr>
<td></td>
<td>• Access to means</td>
</tr>
<tr>
<td>Past suicidal behavior</td>
<td>• Suicide attempt in recent past</td>
</tr>
<tr>
<td></td>
<td>• Multiple suicide attempts in history</td>
</tr>
<tr>
<td></td>
<td>• Low risk of detection</td>
</tr>
<tr>
<td></td>
<td>• Well organised suicide attempt</td>
</tr>
<tr>
<td></td>
<td>• Methods with high lethality</td>
</tr>
<tr>
<td></td>
<td>• Regret having survived</td>
</tr>
</tbody>
</table>

adapted from Chehil & Kutcher, 2012
Evaluate recent suicidality

- Triggers for suicidality
- Suicidal ideation
- Suicidal intention
- Suicide plans
- Suicide motivation
- Deterrents/ puffers
Evaluate past suicidal behavior

- What happened
- How often (frequency)?
- In which context (triggers, emotions, place, circumstances, ...)?
- How high was the potential lethality?
- What kept them alive?
### Risk factors (possibility to modify)

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographic</td>
<td>Male, increasing age, single</td>
</tr>
<tr>
<td>Psychosocial</td>
<td>Low social support, unemployment, decrease in SES, access to means</td>
</tr>
<tr>
<td>Mental health</td>
<td>Mental health disorder</td>
</tr>
<tr>
<td>Somatic health</td>
<td>Untreatable cancer, HIV/AIDS, hemodialysis, SLE, chronic pain, ...</td>
</tr>
<tr>
<td>Psychological dimensions</td>
<td>Hopelessness, psychache, decreased self-esteem, narcissistic traits, perfectionism</td>
</tr>
<tr>
<td>Behavioral dimension</td>
<td>Impulsivity, aggression, panic attacks, agitation, intoxication, past suicide attempt</td>
</tr>
<tr>
<td>Cognitive dimension</td>
<td>Black/white and rigid thinking</td>
</tr>
<tr>
<td>Trauma</td>
<td>CAN, loss of parents</td>
</tr>
<tr>
<td>Family history</td>
<td>Family history of mental health disorders and suicidality</td>
</tr>
</tbody>
</table>
Specific stressors for adolescents

- Feelings of shame
- Bullying, social ostracism
- Feelings of being a failure
- Fear to lose a loved person
**AACAP Parameters**

Checklist for Assessing Child or Adolescent Suicide Attempters in an Emergency Room or Crisis Center

<table>
<thead>
<tr>
<th>Attempters at Greatest Risk for Suicide</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suicidal history</td>
</tr>
<tr>
<td>Still thinking of suicide</td>
</tr>
<tr>
<td>Have made a prior suicide attempt</td>
</tr>
<tr>
<td>Demographics</td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Live alone</td>
</tr>
<tr>
<td>Mental state</td>
</tr>
<tr>
<td>Depressed, manic, hypomanic, severely anxious, or have a mixture of these states</td>
</tr>
<tr>
<td>Substance abuse alone or in association with a mood disorder</td>
</tr>
<tr>
<td>Irritable, agitated, threatening violence to others, delusional, or hallucinating</td>
</tr>
</tbody>
</table>

*Do not discharge such patients without psychiatric evaluation.*
<table>
<thead>
<tr>
<th>Risk level</th>
<th>Risk-/ protective factor</th>
<th>Suicidality</th>
<th>Possible interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>moderate</td>
<td>Multiple risk factors, low protective factors</td>
<td>Suicidal thoughts with intention to die but no concrete plan</td>
<td>Inpatient admission may be indicated depending on accumulation of risk factors. Safety planning in case of discharge.</td>
</tr>
<tr>
<td>low</td>
<td>Modifiable risk factors, strong protective factors</td>
<td>Suicidal thoughts without intention, plan or behaviors</td>
<td>Outpatient treatment, safety planning</td>
</tr>
</tbody>
</table>
Documentation

- Risik Level
- Reasons for choosing risk level
- Treatment plan to reduce risk

Example:

The 17-year-old patient has lost his job two months ago and can be diagnosed with a major depressive disorder (F32.2). Although he states having no suicidal ideation, his risk is seen as moderate to high, given that he was brought to the ED after an interrupted suicide attempt through hanging and has mentioned hopelessness as well as severe alcohol and THC consumption. The patient will be admitted to the inpatient ward with constant surveillance. Re-Evaluation tomorrow morning.
Safety planning

<table>
<thead>
<tr>
<th>SAFETY PLAN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1: Warning signs:</strong></td>
</tr>
<tr>
<td>1. __________________________________________</td>
</tr>
<tr>
<td>2. __________________________________________</td>
</tr>
<tr>
<td>3. __________________________________________</td>
</tr>
</tbody>
</table>

**Step 2: Internal coping strategies - Things I can do to take my mind off my problems without contacting another person:**

| 1. __________________________________________ |
| 2. __________________________________________ |
| 3. __________________________________________ |
| 4. __________________________________________ |

**Step 3: People and social settings that provide distraction:**

| 1. Name________________________________ Phone__________________ |
| 2. Name________________________________ Phone__________________ |
| 3. Place_________________________________________ |
| 4. Place_________________________________________ |

**Step 4: People whom I can ask for help:**

| 1. Name________________________ Phone__________________________ |
| 2. Name________________________ Phone__________________________ |
| 3. Name________________________ Phone__________________________ |

**Step 5: Professionals or agencies I can contact during a crisis:**

| 1. Clinician Name____________________ Phone__________________ |
| Clinician Pager or Emergency Contact # ___________________ |
| 2. Clinician Name____________________ Phone__________________ |
| Clinician Pager or Emergency Contact # ___________________ |
| 3. Suicide Prevention Lifeline: 1-800-273-TALK (8255) |
| 4. Local Emergency Service _________________________________ |
| Emergency Services Address_______________________________ |
| Emergency Services Phone________________________________ |

**Making the environment safe:**

| 1. __________________________________________ |
| 2. __________________________________________ |

Safety planning

- Safety Planning:
  - RCT in ED (n=1640, 18+y, Intervention: 1186): 6m FU: 2010-2015
  - SPI+: SPI and min. 2 telephone contacts (max. 72h after: risk assessment, revision of SPI, mental health facilitation)
  - Suicidal behavior less likely (3.03% vs. 5.29%)
  - Nearly halving the odds of suicidal behavior (OR: 0.56)
  - Higher odds of attending at least 1 outpatient mental health visit (OR: 2.06)

![Graph showing proportion with suicidal behavior](image-url)
Safety planning

• As Safe As Possible (ASAP), using BRITE app:
  • in suicidal adolescents (n=66: SI: 26, SA: 40)
  • ASAP: 3h intervention at inpatient ward + 2 telephone calls after discharge
  • BRITE App: level of emotional distress and personalized strategies for emotional regulation and safety planning
  • No statistical significant difference (SA in 16.1% vs. 31%)
  • Longer time to suicide attempt
  • High satisfaction reported