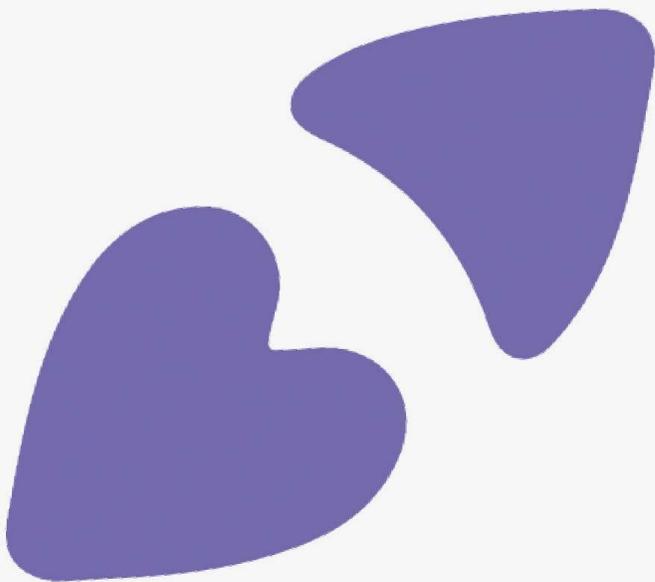# Voi

SUICIDE RISK ASSESSMENT

CASE STUDY:

Billings Clinic

Problem

Every year
44,965
Americans die by suicide.

With rates continuing to **rise over the past 15 years**, suicide has become a nationwide epidemic. For this reason, in 2016, the Joint Commission mandated that healthcare organizations providing inpatient or outpatient care improve detection of the risk of suicide and improve care for those at risk.[1]
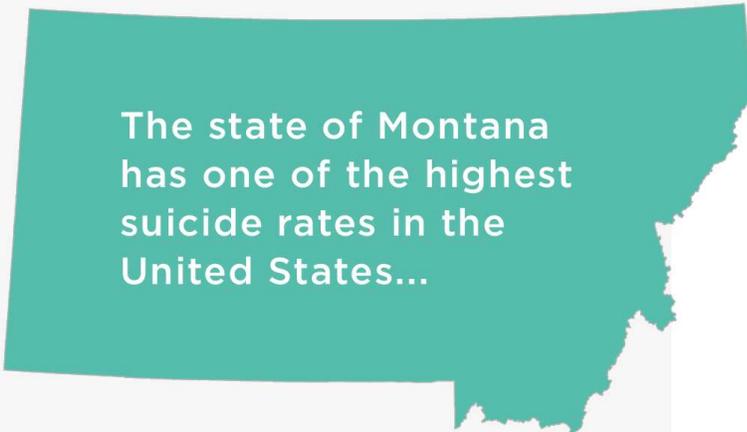
The state of Montana has one of the highest suicide rates in the United States...

Suicide ranks as the **eighth leading cause of death** in the state, claiming more lives than homicides. These deaths have costs: the unquantifiable emotional cost of losing friends, family, and Montana community members, as well as the financial costs. In 2010, suicides in the state accounted for $253,380,000 in medical and work loss expenses.[2]

Objectives

In 2016, Montana's largest healthcare organization, **the Billings Clinic**, conducted a trial using **Voi Detect** in its Emergency Department (ED) to identify individuals with suicidal ideation. The trial objectives were as follows:

- Implement a universal suicide risk screening practice

- Improve the suicide risk assessment process

- Reduce the financial cost of an effective risk assessment

- Reduce the training requirements needed to an effective suicide risk assessment

- Reduce the time needed to administer an effective suicide risk assessment

- Improve workflow for both identifying patients with near-term suicide risk and determining their treatment risk assessment

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[1] https://www.jointcommission.org/assets/1/18/SEA_56_Suicide.pdf. In 2018, the Joint Commission modified the mandate to apply only to psychiatric hospitals and patients being treated for emotional or behavioral issues in general hospitals.

[2] https://afsp.org/about-suicide/state-fact-sheets/#Montana.

Approach

In November 2016, the **Billings Clinic** nurse champions screened over 100 ED patients using **Voi Detect's** exclusive assessment, the Suicide Expert Risk Assessment System (SERAS™), during their intake session. The sessions included confirming patients' personal health information, establishing if they were a new or previous patient, and determining the reason for their visit. The Billings Clinic ED incorporated the screening into the pre-existing workflow - ensuring minimal disruption to established processes.

Background

Some hospitals currently screen for suicide risk. These **traditional methods** for risk assessment, such as standardized questionnaires or clinician interviews, come with limitations and challenges.

Standardized Questionaires

1. **Patient Health Questionnaire-9 (PHQ-9):**

   Quick and easy to administer, but yields underwhelming insight. Quick assessment for screening, diagnosing, monitoring, and measuring the severity of depression. Not designed to assess the risk of suicide.[3]

2. **Columbia-Suicide Severity Rating Scale (C-SSRS):**

   Quick and easy to administer, but yields underwhelming insight. Validated instrument, designed to determine long-term risk, not imminent risk.

Clinician assessments of suicide risk are the **"gold standard"** and are preferred in that they are personalized, more accurate, and yield fewer false positives. Unfortunately, they can be **extremely costly and time-consuming**, and they lack standardization, making it impractical for under-resourced organizations.

Risk assessment tools and processes play crucial roles in creating effective care. **Effective screening** is the first step in identifying at-risk patients, and allows healthcare providers to focus on mitigating risk factors and increasing protective factors to prevent suicide attempts or deaths. Yet many healthcare organizations struggle to implement adequate suicide risk screening due to cost, workflow, and training limitations. This causes patients to slip through the cracks. **Eliminating these barriers** would allow healthcare organizations to adopt universal screening measures and ensure more at-risk patients get the care they need.

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[3] Moreover, given that up to ~50% of people who die by suicide aren't depressed, see W. Breitbart, "Cancer Pain and Suicide," in Advances in Pain Research and Therapy, ed. K. M. Foley et al., vol (New York: Raven Press, 1990), 399-412.), these standardized assessments fail to identify those at risk of suicide not caused by depression.
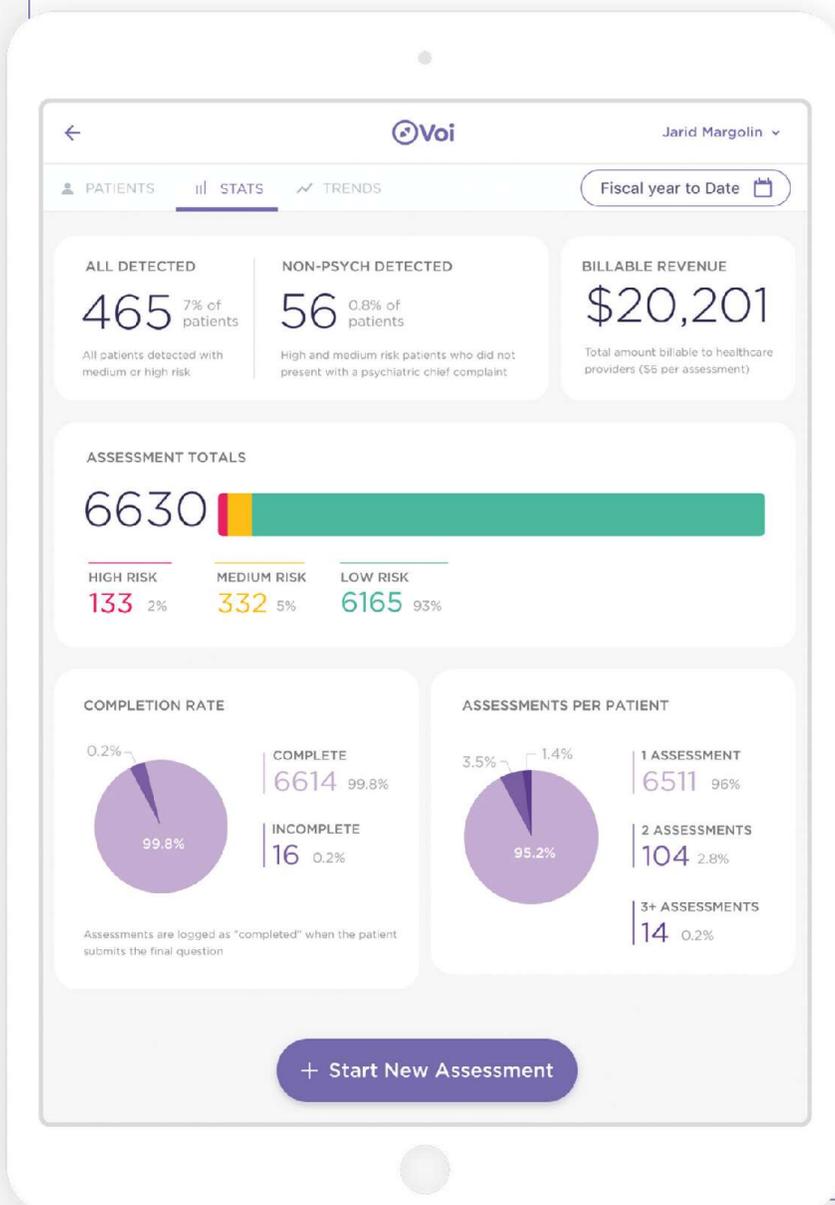
Technology

Voi Detect (previously known as "Proxi" during the Montana trial) is the new standard of care for imminent suicide risk screening and behavioral health assessment. It features an exclusive assessment that screens as well as a psychiatrist, is **HIPAA-compliant**, and delivers digitized risk assessments and detailed analytics on patients and populations. Voi Detect can pull from an **extensive catalog** of standardized assessments, including public-domain instruments, detailed surveys, self-evaluations, questionnaires, and even proprietary instruments to assess for

behavioral health conditions. After delivering the selected assessment, Voi Detect generates real-time risk scores and monitors and tracks operational and compliance metrics. One of these assessments is the **SERAS™**, the only validated suicide risk assessment that predicts near-term suicide risk **(within 72 hours)** and replicates the decision-making of a psychiatrist in less than two minutes, with high user satisfaction.

Voi Detect's technology combines the **time-and cost-efficiency** of standardized assessments with the accuracy and comprehensiveness of clinician assessments, supplemented and enhanced by machine learning, into a single, **easy-to-use** tool. Moreover, Voi Detect has low face validity, as well as accurate sensitivity and specificity around classifying near-term suicide risk. Low face validity - when a respondent cannot figure out what the assessment is meant to discover - is especially important with assessments of this nature, because it reduces the chance that a patient can deceive the assessment and fake the result

Voi Detect features a **scoring algorithm** based on neural network modeling, which, when combined with machine learning, offers powerful insight. **Machine learning** is an application of artificial intelligence - a replication of how humans think and behave - that enables technology to draw upon data and learn as it goes, without constantly being reprogrammed.


←   ⊙Voi   Jarid Margolin ⌄

👤 PATIENTS   �III STATS   ⌁ TRENDS   Fiscal year to Date 📅

ALL DETECTED
465 7% of patients
All patients detected with medium or high risk

NON-PSYCH DETECTED
56 0.8% of patients
High and medium risk patients who did not present with a psychiatric chief complaint

BILLABLE REVENUE
$20,201
Total amount billable to healthcare providers ($6 per assessment)

ASSESSMENT TOTALS
6630

HIGH RISK **133** 2%
MEDIUM RISK **332** 5%
LOW RISK **6165** 93%

COMPLETION RATE
0.2%
99.8%
COMPLETE **6614** 99.8%
INCOMPLETE **16** 0.2%
Assessments are logged as "completed" when the patient submits the final question

ASSESSMENTS PER PATIENT
3.5%   1.4%
95.2%
1 ASSESSMENT **6511** 96%
2 ASSESSMENTS **104** 2.8%
3+ ASSESSMENTS **14** 0.2%

+ Start New Assessment

As more patients complete risk assessments using Voi Detect, the technology continually **"learns"** from these interactions, improving with each additional assessment. It uses the algorithm to create a weighted attribution to answers, and infers the relationship between various answers to better determine and classify patient risk. Thus, the technology also helps eliminate false positives and false negatives, ensuring that those who are truly at-risk have an opportunity to receive the help they need.

Assessment Data

Nurses or other designated personnel (e.g., medical assistants) can use **Voi Detect** to conduct assessments with patients coming through the ED during their intake session, as part of the overall series of intake assessments. It **only takes two minutes**. The assessment can be completed either on an iPad, via a workstation, or even verbally.

Voi Detect's exclusive assessment, **SERAS,** was used for the Billings Clinic trial. It consists of: **11 questions**, though the risk of near-term suicide can typically be determined after six questions; **patient categorization**, organized into three risk categories: low, medium, high; and **assessment results**, which administrators get with guidance on how to proceed.
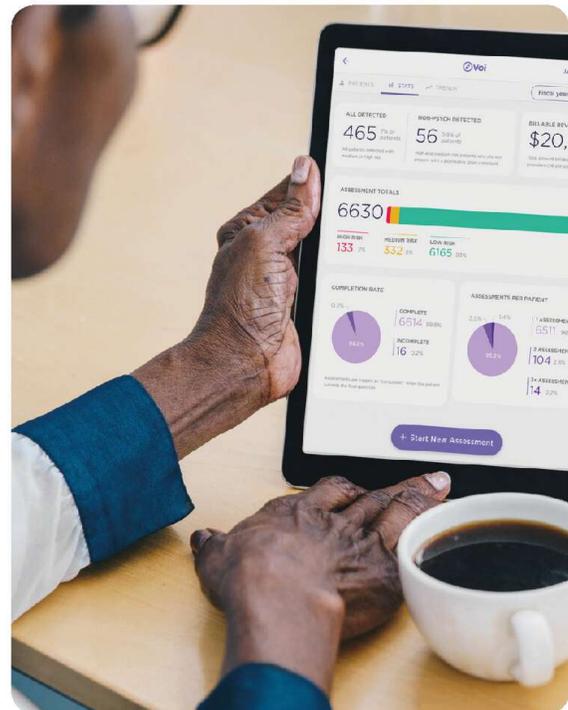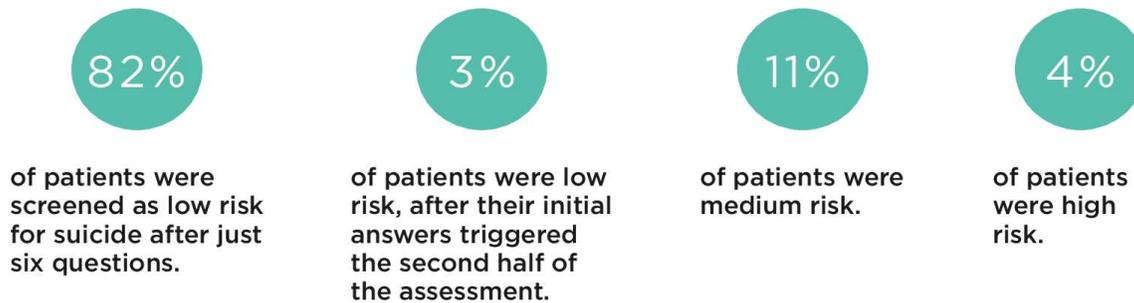
After the patient completes the assessment and the administrator receives the results, Voi Detect **provides statistics** to the organization including:

- **Number of people at risk**
- **Number of people at risk who came in without a chief psychiatric complaint**
- **Long-term statistics of risk over time**

This information provides a clearer picture for both administrators and healthcare organizations about a specific patient's diagnosis in relation to the entire organization's statistics.

Results

The Billings Clinic found that of the patients who were screened in the ED:

82%

of patients were screened as low risk for suicide after just six questions.

3%

of patients were low risk, after their initial answers triggered the second half of the assessment.

11%

of patients were medium risk.

4%

of patients were high risk.

Additional results showed **20.9%** of the entire sample group had come to the ED with a primary psychiatric complaint.

However **50%** of the patients determined to be at high-risk had not come to the ED with a primary psychiatric complaint. This demonstrates that **Voi Detect was able to identify people who would have never been screened or identified as having suicidal thoughts or being at imminent risk.**

Additionally because Voi Detect is reimbursable through CPT code 96127 at about **$6.50** per assessment, the Billings Clinic did not incur any cost or need to hire any additional staff to incorporate the tool into its workflow. (More information is available on CPT codes through Voi).

Due to Voi Detect's success in identifying at-risk patients the state of Montana awarded <u>a large grant</u> to Billings Clinic in early 2018 to deploy Voi Detect throughout the state. Billings Clinic has since launched Voi Detect in 11 affiliated hospital EDs.

Conclusion

Implementing Voi Detect at the Billings Clinic enabled the ED to identify and treat patients at imminent risk for suicide **without adding** any time or costs, with the same **high quality** and accuracy as clinician ratings. By incorporating Voi Detect into the ED's existing workflow for processing intake patients, there was no strain on resources or staffing. In fact, the ED was able to identify previously unidentifiable high-risk patients who came in for a non-psychiatric complaint, due to the implementation of universal screening enabled by Voi Detect.

Expanded Voi Detect implementation sites in Montana
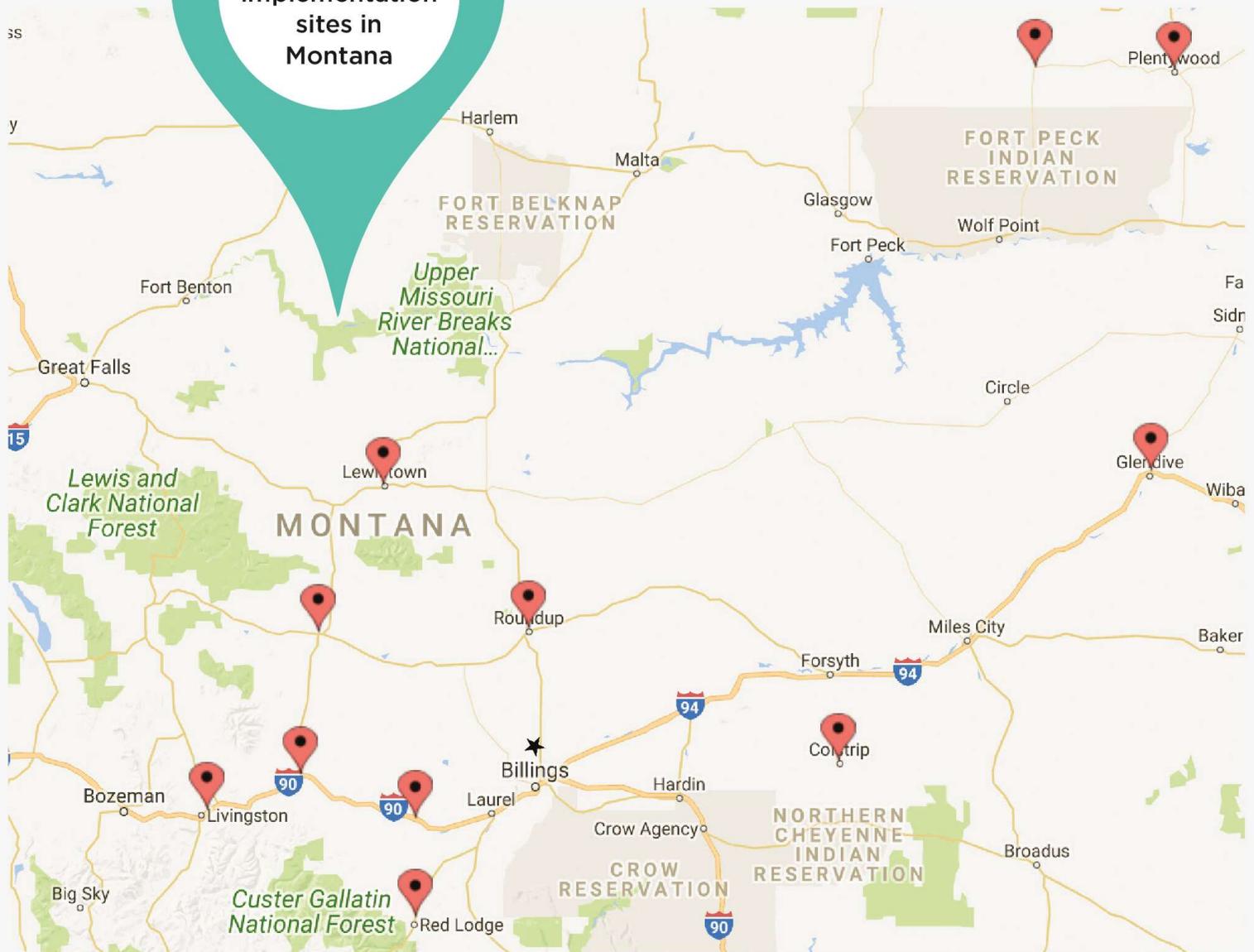
★ | Billings Clinic Case Study Location

Ultimately Voi was able to eliminate **time, cost, work-flow, and training limitations** that prevented universal screening from being practically applied to the ED prior to the trial, while also helping the healthcare organization meet the Joint Commission mandate. Given the **success** of the Billings Clinic's use of Voi Detect in its ED, the trial proved the feasibility of implementing universal screening into healthcare organizations' pre-existing workflows to help identify at-risk patients, and **work towards** better suicide prevention.

About Voi

Voi is a healthcare technology company delivering empirically-validated solutions that address the needs of those at risk for suicide and other behavioral health issues, as well as those who care for them.

The Voi platform offers a suite of tools that combine **science, technology, collaboration, and compassion** to identify and aid at-risk individuals. Voi can help hospitals, health systems, public agencies, and higher education institutions solve many of their complex challenges: keeping people alive and well, managing risks, creating standards, documenting and implementing best practices, lowering costs, and generating revenue.
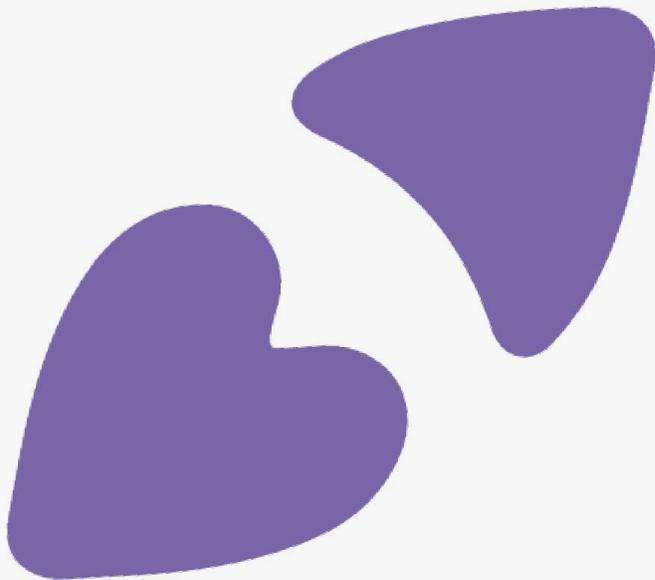
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