

Adolescent Non-Suicidal Self-Injury (NSSI) Interventions

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TOPIC: Evidence-based treatment of non-suicidal self-injury (NSSI) in adolescents.

PURPOSE: To review the evidence base supporting current interventions for NSSI.

SOURCES USED: PubMed searches and ancestry analysis.

CONCLUSIONS: All treatments studied—developmental group therapy, individual cognitive-behavioral therapy, and dialectical behavioral therapy for adolescents—were found to be comparable to the typical treatments offered in the treatment settings where the research was conducted. Additional strategies such as harm reduction have very limited evidence suggesting they may be helpful. A few common interventions including relaxation techniques have extremely limited evidence suggesting they may be perceived as harmful by clients.

Introduction

Non-suicidal self-injury (NSSI), the deliberate destruction of one's body tissues for nonsocially sanctioned reasons but not as a suicide attempt (Klonsky & Muehlenkamp, 2007), is a concerning, repetitive behavior typically beginning between ages 14 and 24 (Nixon, Cloutier, & Jansson, 2008). Incidence is high in adolescents and higher in adolescents with mental illness. No NSSI treatment or intervention has been extensively studied in adolescents. The authors will review the existing literature on the treatment of NSSI in adolescents, both identifying current treatments and interventions and reviewing the existing literature studying those treatments and interventions.

Background and Theory

Nock and Prinstein (2004) found that 82% of adolescents with a history of inpatient treatment reported a history of NSSI. Lloyd-Richardson, Perrine, Dierker, and Kelley (2007) identified that 27.7% of a convenience sample of students in grades 9–12 reported they had engaged in NSSI in the last year. This incidence is similar to estimates in previous studies. Incidence was not influenced by sex, age, socioeconomic status, or living situation. Their NSSI included cutting, burning, scraping, and self-tattooing. Most patients with NSSI have multiple reasons for engaging in this behavior (Lloyd-Richardson et al., 2007; Prinstein, 2008). The most commonly reported reason for NSSI (41%) was to feel anything at all, even pain. Other reasons reported at levels at or

above 33% were “to try to get a reaction from someone, even if it is negative,” “to stop bad feelings,” “to get control of the situation,” “to give yourself something to do when alone,” “to get attention,” and “to relieve feeling numb or empty,” showing that adolescents report two main reasons for NSSI: social and emotional (Lloyd-Richardson et al., 2007, p. 1189).

Though not all individuals who engage in NSSI meet criteria for a mental disorder, NSSI is predictive of a psychiatric diagnosis (Klonsky & Muehlenkamp, 2007). NSSI is a diagnostic criterion for borderline personality disorder (BPD) (American Psychological Association, 2000) and is also suggestive of bipolar I disorder (Joyce, Light, Rowe, Cloninger, & Kennedy, 2010). Clients with anxiety, depression, an eating disorder, or substance abuse are at increased risk of NSSI (Klonsky & Muehlenkamp, 2007). Clients who present with NSSI are more likely to have particular personality characteristics including “harm avoidance” (Joyce et al., 2010, p. 253), “negative emotionality . . . deficits in emotion skills . . . [and] self derogation” (Klonsky & Muehlenkamp, 2007, p. 1047–8), and “neuroticism and openness to experience” (Brown, 2009, p. 30). These deep-seated traits may contribute to initial or chronic NSSI and may in some cases result from attachment disorders or childhood abuse. NSSI functions as an emotional regulation strategy and is therefore secondary to a condition in which the client lacks the knowledge, willingness, or ability to regulate emotions, particularly intense emotions, in a socially acceptable and healthy way (Hall & Place, 2010). It has been found to correlate with emotional dysregulation in female young adults (Gratz & Roemer, 2008).

Potential causative factors for this dysregulation have been explained theoretically. Wallin (2007) wrote that emotional regulation ability is often a function of childhood experience, particularly caregiver attachment. Problematic attachment, childhood abuse, and other pathology can predispose some clients to states of high emotionality and even to dissociative states. These clients may engage in drastic behavior such as NSSI to express or regulate intense emotional states. Clients experiencing dissociation who feel a frightening distance from their own feelings may find NSSI offers relief through creating pain and highlighting the reality of embodiment (Wallin, 2007). Adolescents with NSSI tend toward more negativity and emotional distance in their relationships with parents (Prinstein, 2008) which may be reflective of lifelong attachment problems in some cases.

Literature Review

Several authors have established that NSSI is a common and concerning behavior in adolescents (Lloyd-Richardson et al., 2007 and Nixon et al., 2008) but there are comparatively few studies of interventions for NSSI. Literature searches on this topic are complicated by the use of multiple terms to describe NSSI, including “deliberate self-harm (DSH),” “parasuicide,” “self-injurious behavior,” “self-mutilation,” and “self-wounding,” and are further complicated by the fact that some uses of each of the above terms include both NSSI and self-injury with suicidal intent (Mangnall & Yurkovich, 2008). Some authors have used these terms to refer to self-injurious actions such as headbanging in severely mentally retarded or autistic individuals (Richman & Lindauer, 2006). In this article, NSSI indicates deliberate self-injury that is not intended to be fatal and is related to social or emotional factors as opposed to developmental disability.

PubMed was used to search the literature for the term NSSI and the above terms often used to describe NSSI behavior in any combination with the terms “intervention,” “therapy,” or “treatment.” Combinations returning more than 100 results were refined using two separate methods in order to increase the likelihood of retaining relevant results in at least one search. The first refining process was to narrow the search to review studies. Subsequently, the initial search was recreated and narrowed with the modifier “adolescent.” Articles over 10 years old were excluded. Relevant search results were identified and subjected to ancestry analysis. A total of 13 publications were identified for inclusion, including two randomized controlled trials (RCTs), several correlational studies, and multiple expert opinions.

Evidence supporting treatments and interventions can be conceptualized as spanning a broad range of strength ranging from meta-analyses to expert opinions. Melnyk and Fine-Overholt (2005) divided this range into seven levels and described criteria for inclusion in each level. The 13 publica-

tions described above were classified according to this system in order to describe the relative strength of evidence in each publication (see Table 1).

Evidence-Based Interventions

Nock noted in 2010 that at that time no treatment for NSSI could be considered “evidence-based.” He did not define this subjective term. No evidence identified in the above literature search suggested that any treatment program is more effective than the treatment as usual (TAU) in the settings studied. Results of other interventions varied.

Perhaps the most validated intervention studied for adolescents with NSSI is the “therapeutic assessment.” This was compared in 70 adolescents to typical psychosocial assessments by Ougrin et al. (2011). Both the treatment group and the control group received a standard 1-hr psychosocial assessment. The specifics of this assessment were not defined by the authors. A manualized 30-min therapeutic intervention was then provided to the treatment group directly after their assessment as a part of their initial visit. Three months after the initial visit, the clients who had not been lost to follow-up were assessed for continuing NSSI. No change in NSSI frequency was noted between the therapeutic assessment and assessment-as-usual groups. Eighty-six percent of clients who had received a therapeutic assessment attended at least one follow-up appointment compared only to 51% of clients in the control group. Assuming that continued treatment is helpful in the reduction of NSSI, therapeutic assessment may be a strong intervention in the reduction of NSSI through promoting continuing treatment.

Green et al. (2011) published an RCT in which 366 adolescents were randomized to either a developmental group therapy program lasting 6 or more weeks or TAU. The treatment was described only briefly by the authors as a manualized program incorporating principles of cognitive-behavioral therapy (CBT), dialectical behavioral therapy (DBT), and group therapy. Therapy was directed at difficulties common in adolescents with self-harm such as bullying. No significant difference between treatment groups was found. The results were potentially clouded by unexpectedly robust improvement in the TAU group. Results of this specific group therapy program may not be generalizable to other group therapy programs.

DBT, a treatment related to CBT, was developed for use in adult females with BPD (Shearin & Linehan, 1994). Katz, Cox, Gunasekara, and Miller (2004) compared DBT to TAU in a quasi-experimental study of 64 adolescents in a pediatric inpatient unit. DBT reduced NSSI at 1 year but did not significantly differ from TAU consisting of psychodynamic individual and group therapies. This finding echoes findings for DBT in adults: NSSI is reduced but not significantly more than by expert treatment or other appropriate available treat-

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Table 1. Hierarchical Table of Evidence

Citation	Interventions	Outcomes	Design	Comments	Level
Ougrin, D., Zundel, T., Ng, A., Banarsee, R., Bottle, A., & Taylor, E. (2011). Trial of therapeutic assessment in London: Randomised controlled trial of therapeutic assessment versus standard psychosocial assessment in adolescents presenting with self-harm. <i>Archives of Disease in Childhood</i> , 96, 148–153.	Specialized, manualized assessment including 30 min of therapy	Increase in attendance at follow-up appointments	RCT of specialized assessment versus standard assessment for adolescents (N = 70)	This is the only RCT of any treatment in adolescents with significantly positive results.	II
Green, J.M., Wood, A.J., Kerfoot, M.J., & Trainor, G. (2011). Group therapy for adolescents with repeated self-harm: Randomised controlled trial with economic evaluation. <i>British Medical Journal</i> .	Manualized developmental group therapy for 6+ weeks	Treatment and control group improved to same level	RCT of a group therapy versus TAU (N = 366)	No difference between groups; however, the control group improved more than expected	II
Katz, L. Y., Cox, B. J., Gunasekara, S., & Miller, A. L. (2004). Feasibility of dialectical behavior therapy for suicidal adolescent inpatients. <i>Journal of the American Academy of Child and Adolescent Psychiatry</i> , 43(3), 276–282.	DBT on a pediatric inpatient unit	Reduced parasuicidal behavior at 1-year F/U	Quasi-experimental trial of DBT versus TAU in 62 suicidal adolescents	No difference between groups	III
Taylor, L. M. W., Oldershaw, A., Richards, C., & Davidson, K. (2011). Development and pilot evaluation of a manualized cognitive-behavioral treatment package for adolescent self-harm. <i>Behavioural and Cognitive Psychotherapy</i> .	Individual CBT program for adolescent DSH; 8–12 sessions with optional parent sessions	Reduced DSH at end of therapy and at 3-month F/U, 36% dropout rate	Single correlational study of 25 adolescents	CBT has not been studied as extensively as DBT for NSSI.	IV
Fleischhaker, C., Böhme, R., Sixt, B., & Brück, C. (2011). Dialectical behavioral therapy for adolescents (DBT-A): A clinical trial for patients with suicidal and self-injurious behavior and borderline symptoms with a one-year follow-up. <i>Child and Adolescent Psychiatry and Mental Health</i> , 5(3).	DBT-A for 16–24 weeks for adolescents with DSH including NSSI and other BPD symptoms	No suicide attempts, reduced NSSI, reduced DSH including NSSI and BPD symptoms at 1-year F/U	Single correlational study of 12 adolescents	DBT-A reduces other personality disorder symptoms as well as NSSI.	IV
Bergen, H., Hawton, K., Waters, K., Cooper, J., & Kapur, N. (2010). Psychosocial assessment and repetition of self-harm: The significance of single and multiple repeat episode analyses. <i>Journal of Affective Disorders</i> , 127, 257–265.	PSA for self-harming patients in the emergency department	Decreased risk of repeat episode	Review of data from the Multicentre Study on Self-harm in England, 2000–2007	No data by age groups available	IV
Slee, N., Arensman, E., Garnefski, N., & Spinhoven, P. (2007). Cognitive-behavioral therapy for deliberate self-harm. <i>Crisis</i> , 28(4), 175–182.	Evidence-based treatments for DSH include six similar foci that can be used together in an eclectic fashion not limited to any treatment model.	NA	Observation of similar features of validated treatments, expert opinion	It is difficult to establish an evidence base for eclectic therapies because they differ widely between providers.	VI
Kool, N., van Meijel, B., & Bosman, M. (2009). Behavioral change in patients with severe self-injurious behavior: A patient's perspective. <i>Archives of Psychiatric Nursing</i> , 23(1), 25–31.	Six steps: limit setting, self-esteem, making meaning, free choice, replacements, maintenance. Medications.	Patients found six steps helpful, medications unhelpful.	Qualitative report of interviews of 12 adult female patients		VI
Huband, M., & Tantam, D. (2004). Repeated self-wounding: Women's recollection of pathways to cutting and of the value of different interventions. <i>Psychology and Psychotherapy: Theory, Research and Practice</i> , 77, 413–428.	Long-term relationship with one worker, emotional expression, relaxation	Long-term worker and emotional expression experienced as helpful, relaxation experienced as unhelpful	Qualitative report of interviews of 10 adult female patients		VI
Inckle, K. (2010). At the cutting edge: Creative and holistic responses to self-injury. <i>Creative Nursing</i> , 16(4), 160–165.	Harm reduction, "holistic" care	Elimination of NSSI with continued NSSI thoughts	Expert opinion and four case studies	Harm reduction in adults is ethically problematic	VII
Ghafoor, S. (2008). Out of harm's way. <i>Nursing Standard</i> , 22(43), 61.	RN-supervised NSSI	NA	Opinion of staff RN		VII
Pembroke, L. (2006). Limiting self-harm. <i>Emergency Nurse</i> , 14(5), 8–10.	Harm reduction	Prevention of severe injury despite worsening NSSI	Opinion of patient		VII

Note. BPD, borderline personality disorder; CBT, cognitive-behavioral therapy; DBT, dialectical behavioral therapy; DBT-A, dialectical behavioral therapy modified for adolescents; DSH, deliberate self-harm; F/U, follow-up; NSSI, non-suicidal self-injury; RCT, randomized controlled trial; RN, registered nurse; TAU, treatment as usual.

Evidence levels used: Level I: a systematic review or meta-analysis of all relevant RCTs, or evidence-based clinical practice guidelines based on systematic reviews of RCTs; Level II: at least one well-designed RCT; Level III: well-designed controlled trials without randomization; Level IV: well-designed case-control or cohort studies; Level V: systematic reviews of descriptive and qualitative studies; Level VI: a single descriptive or qualitative study; Level VII: opinions of authorities and/or reports of expert committees (Melnyk & Fine-Overholt, 2005).

ments (Nock, Teper, & Hollander, 2007). A modification of DBT for adolescents (DBT-A) has been further studied. Fleischhaker, Böhme, Sixt, and Brück (2011) published results of a correlational study in which 12 adolescents with NSSI and other BPD symptoms were treated with DBT-A. This is in contrast to other studies that did not focus on adolescents with BPD symptoms. DBT-A was found to be helpful in reducing both NSSI and other symptoms of BPD with continued gains at 1-year follow-up.

CBT has also been studied in adolescents with NSSI. Taylor, Oldershaw, Richards, and Davidson (2011) developed a manualized CBT individual therapy program ("Cutting Down") lasting 8–12 weeks. Manualized CBT entails adherence to a written therapy program while in nonmanualized CBT the principles of CBT are followed by clinicians through their own clinical judgment (Kramer, 2009). The Cutting Down program manual included cognitive-behavioral assessment, motivational strategies, and coping skills. Patients were invited to participate while on a waiting list for other treatment. The 25 adolescents in the pilot study reported reduced NSSI after treatment with continued reduction at a 3-month follow-up. One third of participants did not complete therapy. This group was primarily composed of older teens. An RCT would improve the evidence base for this manualized treatment.

CBT has many variations of which each has varying and overlapping components. Some CBT components were thought by Slee, Arensman, Garnefski, and Spinhoven (2007) to be especially suited to the treatment of DSH, a term they did not define. The authors reviewed CBT packages developed for or studied in adult patients with DSH and identified several components that may reduce DSH behavior: facilitating trust in the provider, increasing helpful beliefs, enhancing mood tolerance, changing behavior by increasing activity and improving problem-solving skills, building interpersonal skills through improving communication and improving social functioning, and incorporating relapse prevention. They noted that nonmanualized CBT incorporating these mechanisms of change may be effective in the treatment of DSH. The authors also noted that it may be important to consider age-related factors in children and adolescents with DSH.

Multiple other treatments and interventions for NSSI were identified through this literature search but no evidence regarding their use in the adolescent population was identified. Interventions studied in adults or in groups including both adolescents and adults included psychosocial assessment in the emergency department, a long-term relationship with one worker, a harm reduction model of care, and therapy based on the steps of healing identified by adult patients who have a history of NSSI but no longer engaged in it.

Psychosocial assessment in the emergency department would ideally be available for every patient presenting there

with NSSI; however, in practice this is not always the case. Hawton et al. (2007) reviewed data from six British hospitals regarding 10,498 emergency department visits for suicidal and non-suicidal self-harm. The authors found that simply performing a psychosocial assessment correlates with reduced future incidence of self-harm for that patient (Bergen, Hawton, Waters, Cooper, & Kapur, 2010). These findings were not analyzed by age group but the largest age groups presenting for care were age 15 to 19 in females and age 20 to 24 in males. This suggests these findings may be relevant in the adolescent population (Hawton et al., 2007).

Kool, van Meijel, and Bosman (2009) gathered information about the experiences of 12 adult females with a history of severe NSSI. Their NSSI behavior began at an average age of 11, which suggests that some of their experiences may be helpful in conceptualizing the process of healing in adolescents as well as in adults. The authors found through qualitative interviews that patients conceptualized recovery in six steps: (a) limit setting for safety, initially by inpatient unit staff but gradually moving to limit setting by the patient herself; (b) developing self-esteem; (c) discovering why the NSSI took place and what role it served for the patient; (d) realizing that she can choose whether or not to self-injure; (e) replacing NSSI with other coping skills; and (f) a maintenance phase. Three interventions were felt to be unhelpful: feeling removed from one's emotions and experiences was a primary reason for NSSI and psychotropic medication was felt to have exacerbated this problem. An excess of attention from staff following NSSI events created a temptation to repeat the behavior to gain attention. High unit expectations resulted in increased anxiety as the patient worried about her inability to live up to these expectations. The clients felt that each of these interventions increased the frequency of NSSI rather than reducing it.

Ten adult females with a history of NSSI were interviewed by Huband and Tantam (2004) in a similar study. The intervention the females perceived as most helpful was having a long-term relationship with a single clinician. Being encouraged to express their emotions was also felt to be helpful. Relaxation training was felt to have been counterproductive. Though their NSSI often followed a buildup of tension and stress, the females felt that attempting relaxation during these moments decreased their ability to resist the urge to harm themselves. Huband and Tantam noted that advocating interventions that ultimately increase NSSI is clearly unethical. The above two qualitative studies highlight principles of care and common interventions. Continuity of care, encouragement of emotional expression, and the above six steps of healing can be appropriate for clients of all ages. Relaxation and medication may decrease the threshold for NSSI in some adults and it is possible that this may also occur in some adolescents.

Inckle (2010) suggested a holistic, harm reduction model of treatment. She used this model with four adult clients, and in all cases NSSI behavior was eliminated despite continued urges to engage in NSSI. A main focus of treatment was seeking to understand the function NSSI serves for the patient. This process included meditation and spirituality and may have been similar to both the “mindfulness” module of DBT and the meaning-making step of recovery described by Kool et al. (2009). Higher education was also an important factor in the healing process in all four cases. Education aided the clients in developing their written expressive abilities and facilitated improved self-understanding. Inckle noted that NSSI represents a coping skill, albeit a problematic one, and that providers who lack this understanding of NSSI may not develop sufficient empathy or understanding to assist their clients.

Ghafoor (2008) anecdotally described harm reduction style interventions in an outpatient clinic. Registered nurse staff in Ghafoor’s practice setting provide clean, sharp instruments and wound-dressing supplies to adult clients and may discuss with clients how many cuts to make or how deep to make them. This strategy assumes that clients will self-injure with or without supervision and that supervision reduces the risk inherent in NSSI. Ghafoor noted that “supervised harm” may cross the ethical boundary of “condoning harm” and that it is quite controversial (Ghafoor, 2008, p. 61).

The harm reduction model was also advocated by an adult client (Pembroke, 2006). When Pembroke was 18 years old, a nurse responded to her NSSI by providing patient education. Basic anatomy and physiology of skin and underlying structures as well as methods for reducing infection risk were explained to her. Pembroke avoided severe injury despite worsening NSSI and she attributed this relative safety to patient education. She advocated teaching first-aid, infection-reduction strategies, anatomy and physiology, and scar reduction and concealment strategies to patients who engage in NSSI. She also provided specific suggestions such as encouraging clients to visualize the bottom of a wound for white cords (tendons) before cutting deeper into the wound.

Summary of Literature Search Findings

Providers treating adolescents with NSSI have a variety of treatment options. Developmental group therapy, DBT-A, and CBT were all shown to correlate with reduced NSSI; however, none were superior to TAU in the settings studied. Several additional interventions may be helpful in this population. Extremely limited evidence suggests that a few interventions may be unhelpful.

Evidence suggests that psychosocial assessment of clients with NSSI presenting to the emergency department correlates with a decreased future incidence of NSSI for the assessed patient. The outpatient use of specialized assessments includ-

ing 30 min of psychotherapy correlates with increased rate of return for follow-up care in adolescents with NSSI. Assuming that adolescents who continue in care are more likely to recover than adolescents who are lost to follow-up, this intervention may have more power to improve outcomes than any other intervention identified in this literature search.

Researchers who conducted small qualitative studies and case studies of adult clients with NSSI have identified stages of healing. They have also described which interventions clients found valuable and which were perceived as harmful. Understanding the meaning of the NSSI was identified as an important part of healing in two studies. Higher education and a relationship with one long-term provider were perceived as helpful. High unit expectations and an excess of attention directly following an NSSI incident were perceived as unhelpful. Women in a small qualitative study felt that encouragement to relax during NSSI urges increased their NSSI behavior. Medication was also perceived to be counterproductive by clients in a small qualitative study. One woman wrote that harm-reduction oriented patient education provided when she was 18 empowered her to use infection control measures and avoid cutting important anatomical structures.

For a summary of current treatments and interventions, see Table 2.

Limitations of the Literature Search

This literature search for interventions for adolescent NSSI has at least two significant limitations. First, terminology differences and relative prevalence of relevant literature resulted

Table 2. Summary of Treatments and Interventions

Treatments/Interventions	Results
Dialectical behavioral therapy	Comparable to TAU
Developmental group therapy	Comparable to TAU
Cognitive-behavioral therapy	Comparable to TAU
Psychosocial assessment in the ED	Reduced incidence of future self-harm
Therapeutic assessment	Improved rate of return for follow-up care
“Meaning Making”	Clients subjectively found it helpful
Continuity of care	Clients subjectively found it helpful
Encouraging secondary education	Case studies suggested it may be helpful
Harm reduction (patient education)	Single-case study suggested it may be helpful
Psychotropic medications	Clients subjectively found it harmful
Relaxation training	Clients subjectively found it harmful
High unit expectations	Clients subjectively found it harmful
Excess attention following NSSI	Clients subjectively found it harmful

ED, emergency department; NSSI, non-suicidal self-injury; TAU, treatment as usual.

in search difficulties. Many terms have been used to describe NSSI and most are not specific to NSSI. Some authors use these terms to describe suicide attempts or behaviors such as headbanging in developmental conditions. There is a comparative lack of literature regarding interventions as opposed to literature regarding incidence. There is also a lack of literature regarding the treatment of adolescents as opposed to adults. As a result of these difficulties, some PubMed searches produced too many results to reasonably review and had to be further refined. Relevant literature may have been eliminated from the search results as they were refined. The use of two separate refining methods may have reduced the impact of this limitation.

Another significant limitation is that the bulk of the identified articles are nonexperimental or relatively low-power experimental studies. More in-depth studies are needed regarding every intervention identified in this literature search. The identified literature is insufficient to provide an understanding of the relative efficacy of the available treatments for adolescents.

Conclusion

NSSI is a psychiatric problem with complex origins (Klonsky & Muehlenkamp, 2007). It often occurs in the adolescent population as well as in adults (Lloyd-Richardson et al., 2007; Nixon et al., 2008); however, few treatments have been studied in the adolescent population. DBT for adolescents, developmental group therapy, and CBT have been studied but none have an evidence base suggesting that they are any more or less helpful in the treatment of NSSI than TAU.

Several other interventions have been studied in adults or in groups of both adolescents and adults. Interventions found to be helpful in these studies include psychosocial assessment in the emergency department, therapeutic assessment by mental health providers, working to discover the meaning of NSSI to the individual patient, continuity of care, encouraging secondary education, and providing patient education including first-aid training. Psychotropic medication, encouragement to relax in response to NSSI urges, high unit expectations, and an excess of attention from clinicians following NSSI incidents were each perceived as counterproductive by adult clients in very small studies.

Additional research regarding each of the above treatments and interventions is needed. Both experimental and nonexperimental studies of larger groups of adolescents may prove particularly helpful in determining the relative efficacy of the available treatments.

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