

Relationship Development Intervention® (RDI®) as Evidence Based Practice for Autism Spectrum Disorders:

Authors: Amy Leventhal, Ph.D. and Deborah Berrang, M.Ed.

January 25, 2010

Relationship Development Intervention® (RDI®) is a cost effective, research guided, intervention approach for remediating Autism Spectrum Disorders (ASD). The purpose of RDI® is to develop intersubjectivity, the agreed upon core of autism's social and communicative deficits (Baron-Cohen, 2000). Intersubjectivity encompasses joint attention, social referencing, theory of mind, social reciprocity, and communication for experience sharing purposes. RDI® has a foundation of research and theoretical support, and a growing body of empirical evidence for its practices.

Based on comprehensive reviews of ASD treatment research, expert consensus is that no evidence exists that any one approach is better than any other approach (National Research Council, 2001; Rogers, 2006; Prizant, 2009). The field of study of ASD as a whole is still very early in the process of determining what kinds of interventions are most efficacious for whom, for what, and when (Rogers & Vismara, 2008). Consequently, applying an evidence-based practice (EBP) approach, espousing a combination of the best available research, clinical expertise, and patient characteristics and preferences (APA 2006) for decision making becomes ever more critical for treatment decision making for ASD (Twachtman-Cullen, 2009). The RDI® program has peer-reviewed evidence to support its efficacy for children with ASD (Gutstein, 2005; Gutstein, Burgess & Montfort, 2007; Hobson, Hobson, Gustein, Ballarani, & Bargiota, 2008) and further studies are in progress. A broader examination of the literature demonstrates a growing body of empirical research evidence and best practice recommendations supporting the practices embedded in RDI®. Specifically, RDI® is a family-centered, intensive, objective driven, individualized intervention targeting the developmental components and processes of joint attention and communication in the context of the parent-child relationship. The summary below outlines the evidence supporting core components of RDI®, reflecting why it is a viable and desirable EBP for treating ASD.¹

SUPPORT FOR RDI® in remediating the core deficits of autism in a developmental progression (e.g. joint attention, social communication, and theory of mind)

Aldred C, Green J, and Adams C. (2004). A new social communication intervention for children with autism: pilot randomized controlled treatment study suggesting effectiveness. *Journal of Child Psychology & Psychiatry*, 45(8), 1420-1430.

Mahoney, G., and F. Perales (2005). Relationship-focused early intervention with children with pervasive developmental disorders and other disabilities: a comparative study. *Journal of Developmental & Behavioral Pediatrics*, 26(2), 77-85.

Jones E. A., Carr E. G., Feeley K. M. (2006). Multiple effects of joint attention intervention for children with autism. *Behavior Modification*. Nov. 30(6):782-834.

¹ Because the evidence for RDI is expected to grow over time, this document is dated and will be updated periodically. Please contact the authors to request the most current version.

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Solomon, R., Necheles, J., Ferch, C. & Bruckman, D. (2007). Pilot study of a parent training program for young children with autism: The P.L.A.Y. Project Home Consultation program. *Autism*, 11, no.3, 205-224.

Howlin, P. (2008). Can children with autism spectrum disorders be helped to acquire a “theory of mind”? *Revista de Logopediay Audiologia*, Vol. 28(7), 74-89.

Whalen, C. and Schreibman, L. (2003). Joint attention training for children with autism using behavior modification procedures. *Journal of Child Psychology and Psychiatry*, 44(3) 456-468.

Kasari C, Freeman S, Paparella T. (2006). Joint attention and symbolic play in young children with autism: a randomized controlled intervention study. *Journal of Child Psychology and Psychiatry*, 47(6) 611-20.

Siller, M. & Sigman, M. (2008). Modeling longitudinal change in the language abilities of children with autism: parent behaviors and child characteristics as predictors of change. *Developmental Psychology*, 44(6), 1691-1704.

Keen D, Rodger S, Doussin K, Braithwaite M. (2007) Pilot study of the effects of a social-pragmatic intervention on the communication and symbolic play of children with autism.” *Autism*, 11(1), 63-71.

Tannock, R., Girolametto, L. & Siegal, L. (1992) Language intervention with children who have developmental delays: Effects of an interactive approach. *American Journal on Mental Retardation*, 97, 145-160.

Hobson, J. A., Hobson, P., Gutstein, S., Ballarani, A., Bargiota, K. (2008, April) Caregiver-child relatedness in autism, what changes with intervention? Poster presented at the meeting of the International Meeting for Autism Research.

SUPPORT FOR RDI® for improving overall functioning related to ASD (outcome research: ADOS diagnostic category, special education placement, flexibility, joint attention)

Gutstein, S., (2005) Relationship Development Intervention: Developing a Treatment Program to Address the Unique Social and Emotional Deficits in Autism Spectrum Disorder. *Autism Spectrum Quarterly*, Winter, 8-12.

Gutstein, S., Burgess, A. & Montfort, K. (2007). Evaluation of the Relationship Development Intervention Program. *Autism*, 11, 397-411.

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Hobson, J. A., Hobson, P., Gutstein, S., Ballarani, A., Bargiota, K. (2008) Caregiver-child relatedness in autism, what changes with intervention? Poster presented at the meeting of the International Meeting for Autism Research.

SUPPORT FOR RDI® for systematically training parents with ongoing consultation and using the parent-child relationship as a natural context for child learning and growth

Drew, A., G. Baird, S. Baron-Cohen, A. Cox, V. Slonim, S. Wheelwright, J. Swettenham, B. Berry, and T. Charman. (2002). "A pilot randomized control trial of parent training intervention for pre-school children with autism." *European Child & Adolescent Psychiatry*, 11, 266-272.

Aldred, C., Green, J., and Adams, C. (2004). "A new social communication intervention for children with autism: pilot randomized controlled treatment study suggesting effectiveness." *Journal of Child Psychology & Psychiatry*, 45(8), 1420-30.

Jones E. A., Carr E. G., Feeley K. M. (2006). Multiple effects of joint attention intervention for children with autism." *Behavior Modification*. Nov. 30(6):782-834.

Schertz, H. H., Odom, S. L. (2007). Promoting joint attention in toddlers with autism: a parent-mediated developmental model. *Journal of Autism and Developmental Disorders*. Sept. 37(8) pp. 1562-1575.

Solomon, R., Necheles, J., Ferch, C. & Bruckman, D. (2007). Pilot study of a parent training program for young children with autism: The P.L.A.Y. Project Home Consultation program." *Autism* 11, no. 3, 205-224.

Mahoney, G., and F. Perales (2005). Relationship-focused early intervention with children with pervasive developmental disorders and other disabilities: a comparative study." *Journal of Developmental & Behavioral Pediatrics*, 26(2), 77-85.

McConachie H, Diggle T. (2007), "Parent implemented early intervention for young children with autism spectrum disorder: a systematic review." *Journal of Evaluation in Clinical Practice*. Feb, 13(1), 120-9.

McConachie, H., Randle, V., Hammal, D., & Le Couteur, A. (2005). A controlled trial of a training course for parents of children with suspected autism spectrum disorder. *Journal of Pediatrics*, 147(3), 335-340.

SUPPORT FOR RDI® for intervening in the child and family's natural environment by incorporating intervention into daily routines that account for caregiver needs and child functioning.

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Prizant, B. (2009). Creating a culture of family-centered practice for the autism community”, *Autism Spectrum Quarterly*, Summer, 30-33.

Prizant, B. (2008). Treatment Options and Parent Choice: An Individualized Approach to Intervention”, *Autism Spectrum Quarterly*, Winter, 34-37.

The research evidence above is not an exhaustive list.

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Article Summaries

Aldred, C., Green, J., and Adams, C. (2004). A new social communication intervention for children with autism: pilot randomized controlled treatment study suggesting effectiveness. *Journal of Child Psychology & Psychiatry*, 45(8), 1420-1430.

This randomized controlled trial (N=28) of 2-6y.o. compared existing care with 12 months of a parent training group. Participants were diagnosed as ASD using the ADOS. Results showed significant improvement among those receiving parent training as compared to those receiving routine care. Improvement occurred in the following variables: reciprocal social communication (as measured by ADOS), communicative initiation, parent-child interaction, and expressive language. Parent training focused on communication synchrony, which improved. Shared attention was not directly targeted in treatment and did not change.

Drew, A., G. Baird, S. Baron-Cohen, A. Cox, V. Slonim, S. Wheelwright, J. Swettenham, B. Berry, and T. Charman. (2002). "A pilot randomized control trial of parent training intervention for pre-school children with autism." *European Child & Adolescent Psychiatry*, 11, 266-272.

This randomized control trial (N=24, mean age 23 months) of children diagnosed with Childhood Autism compared standard treatment services (home visits plus speech, occupational, and physio-therapy as appropriate) with parent consultation (consultation on behavior management, promoting compliance, training in the development of early precursors to social and communicative competence, and how to guide their child within joint action routines). Consultation focused on developing social-pragmatic skills, specifically the development of joint attention skills and joint action routines. All children met diagnostic criteria using the CHAT, ADI-R and a structured child-adult interaction assessment. Participants were randomly placed in one of the two groups. Initial baseline and 12 month follow-up measures include the MacArthur Communication Development Inventory, the Griffins Scale of Infant Development, and ADI-R and the Parent Stress Inventory. In this consultant-led model the parents acted as the everyday therapists. Consultants taught, modeled, monitored, and provided feedback. Results indicated that the children from the parent training group had a slightly higher score on language comprehension on the CDI. Significant differences were noted in words understood, gestures understood, and in a decrease in parent stress. More children from the parent training group moved from 'non-verbal' to using single words or phrases. No significant differences between the two groups was noted in number of words produced or gestures produced.

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Gutstein, S. (2005) Relationship Development Intervention: Developing a Treatment Program to Address the Unique Social and Emotional Deficits in Autism Spectrum Disorder. *Autism Spectrum Quarterly*, Winter, 8-12.

This preliminary study looked at RDI®'s effectiveness (N=31, ages 2-9 years, diagnosis of ASD) based on improvement on the ADOS and increased independent functioning in educational settings. 31 children between the ages of 2 and 9 were followed for 16 months. 17 of these children had participated in RDI®, 14 had participated in other treatments. 70% of the children participating in RDI® had improved in at least one diagnostic category on the ADOS. No child participating in other treatments improved on any diagnostic category on the ADOS. By the end of the 16 month period, the RDI® children had moved from 1 of 17 to 13 of 17 participating in regular education settings without significant support. In the non-RDI® group, 1 of 14 participated in regular education settings at the beginning of the study. After 16 months, no additional non-RDI® children had moved into this type of a setting. These preliminary findings support RDI® as an effective intervention for children on the Autism Spectrum.

Gutstein, S., Burgess, A. & Montfort, K. (2007). Evaluation of the Relationship Development Intervention Program. *Autism*, 11, 397-411.

This study examined changes in children participating in RDI® (N=16) on the ADOS and ADI-R, a parent report measure of child's flexibility, and school placement. Study participants were compared prior to treatment and at a minimum of 30 months after treatment began. While all children met ADOS/ADI—R criteria for autism prior to treatment, no child met criteria at follow-up. Positive changes were demonstrated on measures of flexibility and educational placement.

Hobson, J. A., Hobson, P., Gutstein, S., Ballarani, A., Bargiota, K. (2008, April) Caregiver-child relatedness in autism, what changes with intervention? Poster presented at the meeting of the International Meeting for Autism Research.

In an ASD sample (N=30, 3-13 y.o.), this paper demonstrated changes in personal relatedness, but not attachment characteristics, after receiving Relationship Development Intervention® (RDI®), a parent-implemented intervention for 9-38 months. Results reported in this conference poster showed significant changes in parent-child interactions in dyads' moment-to-moment *relatedness* e.g., time spent in connected states of attention, concluding that atypical *relatedness* may change with intervention.

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Howlin, P. (2008). Can children with autism spectrum disorders be helped to acquire a “theory of mind”? *Revista de Logopediay Audiologia*, Vol 28(7) 74-89.

This is a review to understand the theory of mind (ToM) deficits and remediation of such deficits for individuals with ASD. ToM involves a highly complex set of skills. It involves competence in understanding how others think, feel, and believe. It develops dramatically in the first 2-3 years of life (and continues thereafter) and is constantly developing in the context of relationships with others. Howlin summarizes the literature exploring the possible neurological substrates of ToM. Experimental studies generally indicate that specific teaching in areas related to ToM can produce positive results for participants with ASD. Among other limitations, effects have limited generalization to novel tasks or naturalistic settings. The author explains that complex ToM understanding emerges gradually from birth and is associated with many other aspects of cognitive, linguistic and social development. Howlin suggests that intervention needs to begin at a much earlier stage and encompass more of the child’s daily life for more broad effect. The author points to evidence from a number of randomized controlled trials showing positive outcomes by targeting developmental precursors of ToM such as preverbal communication and joint social interaction. This review indicates support for developmental models targeting the foundations of ToM pervasively and intensively.

Jones, E. A., Carr E. G., Feeley K. M. (2006). Multiple effects of joint attention intervention for children with autism. *Behavior Modification*. Nov 30(6), 782-834.

This article summarizes 3 multiple baseline design studies (N= 2 to 5, depending on study; 2-3 yr. old; diagnosed with ASD). In the second study the parents were taught how to teach their preschool-aged children joint attention skills. Results showed that participants acquired joint attention skills with parents, and they acquired them as or more quickly than those taught using discrete trial training or pivotal response training in a classroom setting. Participants also demonstrated a greater degree of maintenance and generalization than those in the classroom study. These results support parent training and natural environments as avenues for effectively improving joint attention in children with ASD.

Kasari, C., Freeman, S., Paparella, T. (2006). Joint attention and symbolic play in young children with autism: a randomized controlled intervention study. *Journal of Child Psychology and Psychiatry*. 47(6) 611-20.

This randomized control trial (N=58, 3-4 y.o, Dx ASD with ADI-R & ADOS) compared participants receiving a manualized intervention with one of three targets: (1) joint attention, (2) symbolic play, (3) control group. Intervention was delivered by trained

experimenters within the context of an early intervention program. Participants received 30 minutes of intervention per day for 5-6 weeks. The approach combined applied

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behavior analysis strategies with developmental, relationship-based strategies to target joint attention skills or symbolic play skills, or no intervention beyond regular participation in the early intervention classroom. The targeted joint attention skills worked on by participants were individualized and based on a sequence of skills aimed to follow a developmental progression and on the participants assessment results.

Keen, D., Rodger, S., Doussin, K., Braithwaite, M. (2007) Pilot study of the effects of a social-pragmatic intervention on the communication and symbolic play of children with autism.” *Autism*, 11(1), 63-71.

This pilot study (N=16, 24-48 mo, dx ASD) used a pre-post test, quasi-experimental design to investigate the effects of a parent training program (Stronger Families Project) focused on a social-pragmatic intervention which emphasized child initiation, motivation, and spontaneity within naturally occurring events and activities. It found significant changes in communication and symbolic behavior based on caregiver scores, [Parenting Stress Index (PSI), Parenting Sense of Competence (PSOC), Communication and Symbolic Behaviour Scales Developmental Profile (CSBS-DP), and Scales of Independent Behaviour Revised (SIB-R)] with the social component approaching significance. Independent observers did not note the same changes. Authors attribute this to possible caregiver bias, or to the ability of parents (caregivers) to note subtle changes in their child’s behavior, especially as they observe over much greater time periods and contextual situations than the independent observers, who rated only a 30 minute period, were able to do. The study supports the effectiveness of parent training programs in addressing delays in child initiation, motivation and spontaneity within naturally occurring settings.

Mahoney, G., and F. Perales (2005). Relationship-focused early intervention with children with pervasive developmental disorders and other disabilities: a comparative study. *Journal of Developmental & Behavioral Pediatrics*, 26(2), 77-85.

This group comparison study (N=50, 12-54mo. old) looked at intervention effects for ASD and DD (developmental disabilities) groups. Both groups received a parent consultation intervention teaching parents responsiveness strategies (using a manualized curriculum) to strengthen attention, persistence, interest, initiation, cooperation, joint attention and affect (called “pivotal developmental behaviors”) and to improve developmental outcomes. This study showed greater improvements in the ASD group for parent responsiveness, child communication and social emotional outcomes such as,

detached (as measured by the TABS), under-reactivity (TABS), self regulation (ITSEA & TABS) and improvements in social competence (ITSEA). This study supports the use of developmental parent consultation models for children dx with ASD for improving communication and social emotional outcomes.

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McConachie, H, Diggle, T. (2007). "Parent implemented early intervention for young children with autism spectrum disorder: a systematic review." *Journal of Evaluation in Clinical Practice*. Feb, 13(1), 120-129.

This research review looks at the effectiveness of parent implemented intervention for children age 1 yr. to 6 yrs 11 mo. with a dx on the autism spectrum. The review included 12 studies that met the inclusion criteria. Both randomized and controlled studies suggest that parent training leads to improved child communicative behavior, increased maternal knowledge of autism, enhanced maternal communication style and parent child interaction, and reduced maternal depression. The results of this review support the use of parent training as a model for intervention with young children affected by ASD. This research review suggests that parent training leads to increased parental skills - allowing for continual opportunity for child learning in a variety of situations. This in turn leads to improved maternal communication style, enhanced parent child interaction, and reduced parent and child stress.

McConachie, H., Randle, V., Hammal, D., & Le Couteur, A. (2005). A controlled trial of a training course for parents of children with suspected autism spectrum disorder. *Journal of Pediatrics*, 147, (3), 335-340.

This controlled trial (N=51) of children aged 24 to 48 months compared the effects of a parent training course between two groups; one who received immediate intervention and a second that had delayed access to the training course. At recruitment children were identified with a language delay and exhibited characteristics of autism. The course ran for 7 months and consisted of weekly group training sessions, 3 home visits, with parent follow-through at home. Targeted areas included parent skills in facilitating communication, parent stress level, parent adaptation to the child, child's vocabulary size, child's behavior, and child's social communication skills. There were no significant group differences for social communication or child behavior problems (Autism Diagnostic Observation Schedule and Behavior Screening Questionnaire). There were no significant differences in parental stress or adaptation (Questionnaire on Resources and Stress, and Parent Feelings Questionnaire). Results show a significant difference between groups in terms of children's vocabulary size (MacArthur Communicative Development Inventory) and a significant advantage for the intervention group in parents' use of facilitative strategies (The Joy and Fun Assessment). The training course was well-

received by parents and had a measurable effect on both parents' and children's communication skills.

Prizant, B. (2009). Creating a culture of family-centered practice for the autism community", *Autism Spectrum Quarterly*, Summer, 30-33.

Prizant, B. (2008). Treatment Options and Parent Choice: An Individualized Approach to Intervention", *Autism Spectrum Quarterly*, Winter, 34-37.

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These two articles are part of a series examining issues related to treatment options and parent choice in the field of ASD. The concept of family-centered philosophy and practice is explored, and current practices in educational and treatment approaches for children with ASD are critically reviewed from that perspective. Author reports that family centered practice is considered the “gold standard” of practice for children with developmental disabilities (including autism) and their families. Yet many of the current, predominate practices in the field of autism are inconsistent with, and often actually violate, these principles. One factor that leads to better outcomes for children with Autism Spectrum Disorders is family involvement and collaboration in their child’s educational programming. The author describes how parents need to be empowered with the knowledge and skills necessary to make the best choice for their child and the family unit as a whole. This article supports the key practices embedded in Relationship Development Intervention® of collaboration between parents and professionals in decision making. Namely, within RDI®, parents are respected as experts regarding their child, and the professionals consider each family’s unique strengths and needs within the dynamic family system.

Schertz, H. H., Odom, S. L. (2007). Promoting joint attention in toddlers with autism: a parent-mediated developmental model. *Journal of Autism and Developmental Disorders*. Sept. 37(8) pp. 1562-1575.

This multiple baseline design compared child performance (N=3, <36 mo, dx autism) across four phases of intervention. Results (M-CHAT, PDD-ST-II, ISCQ) indicate that in response to a parent mediated, developmentally oriented, and interaction based intervention model, two of three toddlers with early identified autism demonstrated joint attention. A third demonstrated progress with precursors to joint attention.

Recommendations that services for young children with autism be intensive should be examined in light of current findings that joint attention can be effectively promoted using one time weekly intervention that supports developmentally grounded parent-child interaction in natural settings. It is also significant to note that after participating in this study, all parents indicated improved confidence in their own ability to support child interaction; increased parent resilience; increased sense of competence; and increased

self-efficacy. This study supports the use of family-centered and family-guided practices for young children with disabilities.

Siller, M. & Sigman, M. (2008). Modeling longitudinal change in the language abilities of children with autism: parent behaviors and child characteristics as predictors of change. *Developmental Psychology*, 44(6), 1691-1704.

In a sample (N=28, 31-64 mo) of children with ASD (using ADOS, ADIR) this longitudinal study examines the contributions of child and mother related to joint attention and reciprocal interaction that contribute over time to language development. Global developmental delay (e.g. IQ) was not predictive of language growth in this sample. Children’s responsiveness to joint attention and their mother’s synchrony in interactions each contributed uniquely to children’s language growth. These findings

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indirectly support the use of parent training and a focus on both child and parent objectives related to joint attention and social reciprocity for positive language outcomes for children with ASD.

Solomon, R., Necheles, J., Ferch, C. & Bruckman, D. (2007). Pilot study of a parent training program for young children with autism: The P.L.A.Y. Project Home Consultation program. *Autism* 11, no.3, 205-224.

This study (N=68, 18-72mo, dx ASD) examines a developmental, relationship-based parent consultation model using modeling, coaching, and video feedback to increase child's participation in reciprocal interaction and social communication. After 8-12 months of intervention, 66% of sample demonstrated good or better progress, as measured by change in developmental level on FEAS. Study supports relationship-based parent consultation approach for ASD sample targeting social reciprocity and communication and use of video review for teaching parents.

Tannock, R., Girolametto, L. & Siegal, L. (1992) Language intervention with children who have developmental delays: Effects of an interactive approach." *American Journal on Mental Retardation*, 97, 145-160.

This randomized control group study compared treatment and delayed treatment groups of developmentally delayed (DD) children (N=32, 20-40 mo) in a 12 week parent training program involving 9 group meetings and 3 individual meetings (with parent). The individual meetings used parent-child video review. The intervention (Hanan) focused on promoting parenting behaviors encouraging reciprocal communication, experience sharing communication and child responsiveness. There were no differences across groups in global communicative and linguistic abilities in this short intervention. Outcomes did show change in parent responsiveness and child vocal turn taking. These

findings support use of parent training models to increase parent responsiveness and child communicative reciprocity.

Whalen, C. and Schreibman, L. (2003). Joint attention training for children with autism using behavior modification procedures. *Journal of Child Psychology and Psychiatry*, 44(3) 456-468.

In this multiple baseline study, (N=5, 28-52mo, dx ASD), joint attention behaviors were taught to children with autism; specifically, responding to showing, pointing and gaze shifting of adult; coordinated gaze shifting; and pointing. Generalization to setting and parent, follow-up session and social validation measures were also analyzed. Joint attention behaviors were effectively trained, and targeted behaviors generalized to other settings. Positive changes were noted (Unstructured Joint Attention Assessment, Structured Laboratory Observations, Structured Joint Attention Assessment) for all 5 of the children after the 10 week intervention for responding to joint attention initiation. Four of the five had positive change in the area of initiating joint attention. The skills were maintained at the 3 month follow up for 3 of the 4 continuing participants, though they were less frequent than had been seen immediately after treatment. Social validation

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measures showed 2 of the 4 remaining children not looking significantly different from their typical peers. For all 4 subjects completing treatment, their significant improvement generalized to other settings and to the child's parent. This research shows that joint attention skills can be taught, and that training parents in these techniques is likely to be helpful in maintaining these skills outside the treatment setting.

The research evidence above is not an exhaustive list.

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