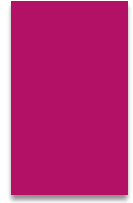




Ketamine-Assisted Psychotherapy: Latest Research, Mechanisms, and Best Practices in Clinical Applications

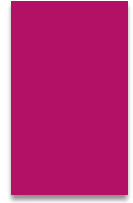
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Certified Psychedelic Assisted Therapy Providers



Accuracy, Utility and Risks Statement

This presentation is an introduction to ketamine-assisted psychotherapy, intended to provide an overview of the elements of KAP. More comprehensive training should be undertaken prior to administering KAP.



Conflicts of Interest and Commercial Support

Neither of today's presenters has any conflicts of interest or commercial support.



Agenda



- ❖ Mechanism of action
- ❖ Elements of KAP, including the different methods of administration
- ❖ Current research on the efficacy of ketamine in treating mental health disorders
- ❖ Training information



Mechanism of Action



Ketamine Terminology

Psychedelics

- 5-HT_{2A} agonists

Ketamine

- A synthetic medicine used in mental health settings as a therapeutic intervention. Also used as an anesthetic and analgesic in medical settings.
- NMDA receptor antagonist

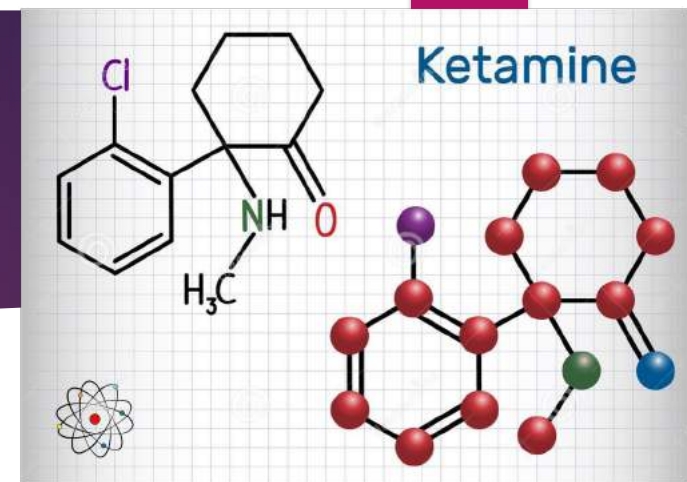
Ketamine Assisted Psychotherapy (KAP)

- A form of psychotherapy where ketamine is taken by a client in coordination with their therapist with the intention of addressing psychological issues.



What exactly is Ketamine?

- First produced in 1962 as an anesthetic
- Used as field anesthetic for soldiers during the Vietnam War
- Became an FDA approved medication in 1970
- On the World Health Organization Essential Medication List
- Currently used as an anesthetic, analgesic, very safe even for children



Dore et al, 2019 provides a concise and informative summary of ketamine's history.



What exactly is Ketamine?

Ketamine comes in two enantiomers (mirror image versions): R and S

The S enantiomer is twice as potent as the R isomer

→ esketamine, or Spravato; a nasal spray that was FDA approved in 2019 for TRD, with strict guidelines about its use

All other routes of administration (ROA) use a racemic mixture of the enantiomers, meaning an equal amount of each

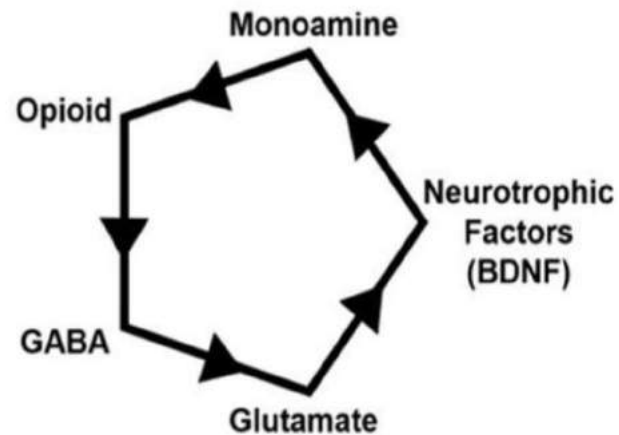


Mechanism of Action

Rapid-acting Antidepressants



Impacted Systems



Outcomes

- ↑ Synaptic Strength
- Rapid and persistent antidepressant effects:
- ↓ Anhedonia
- ↓ Despair
- ↓ Suicidal Ideation

Content and image (directly) from Hess et al., 2021; also Kadriu et al., 2021

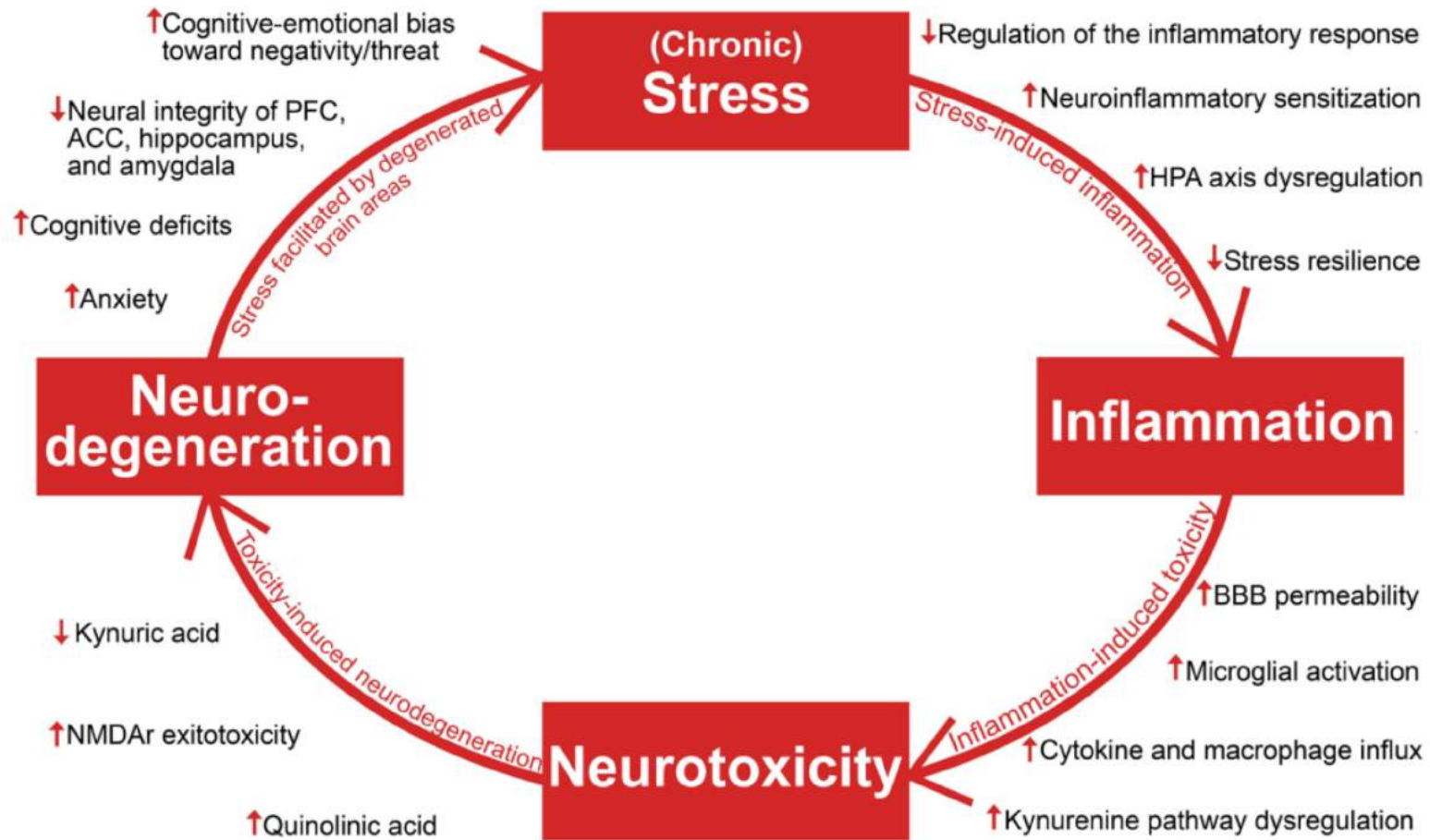
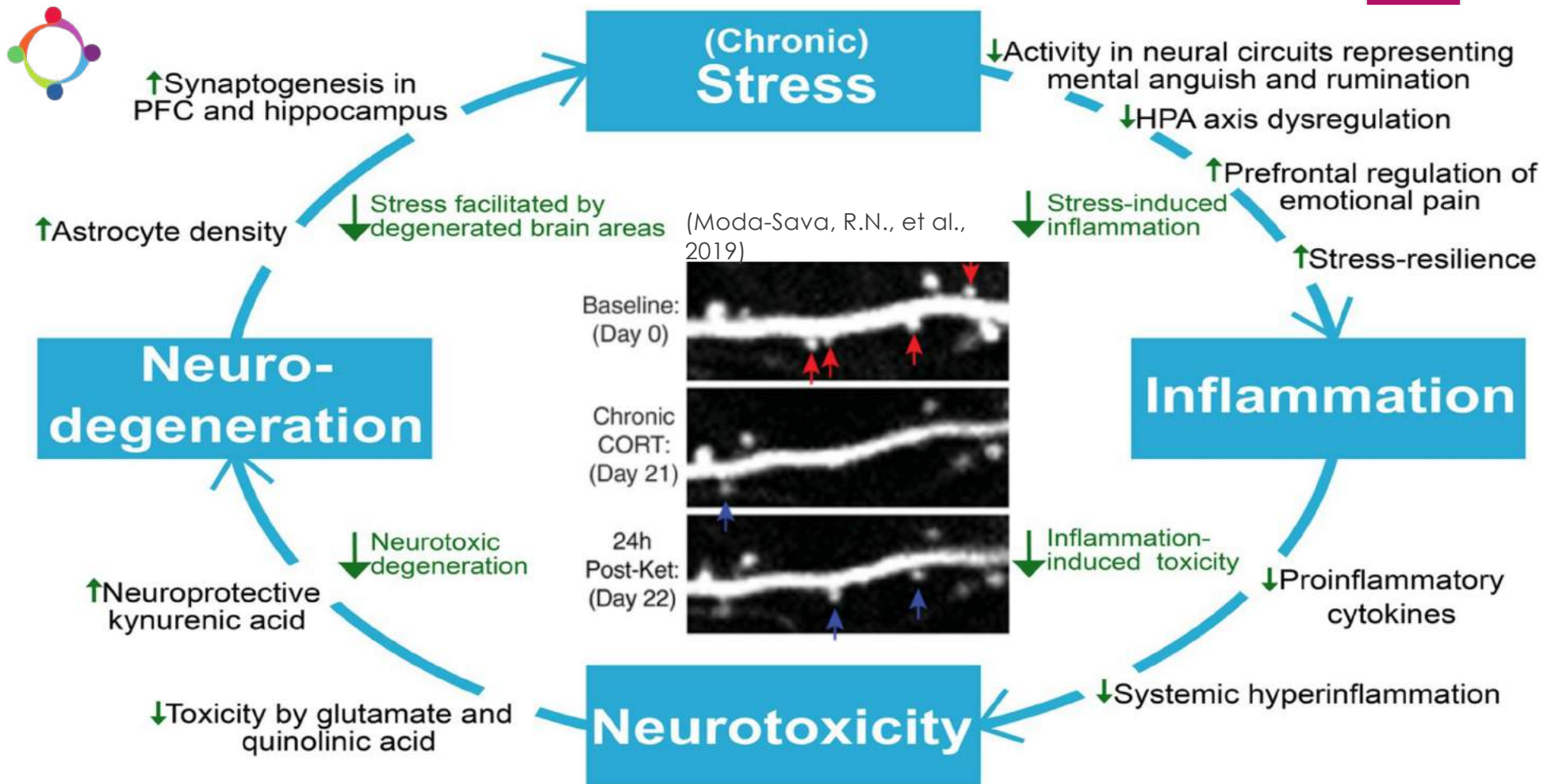


FIGURE 4

Content and image (directly) from Lullau et al., 2023



Content and image (directly) from Lullau et al., 2023



Elements of KAP



Routes Of Administration: How does the client receive the medicine?



INTRAVENOUS

- Can be tailored and customized to the patient
- 100% AVAILABILITY
- Typically 6 treatments over 2-3 weeks followed by boosters every 4-6 weeks



NASAL

- Nasal esketamine is FDA approved
- 12 treatments over 8 weeks, followed by treatment every 1-2 weeks
- 50% AVAILABILITY
- Not as rapid acting and lower rate of response overall



INTRAMUSCULAR

- Dose can be adjusted
- 95% AVAILABILITY
- Less control over the experience compared to IV



ORAL

- ~20% AVAILABILITY
- Overall dose is limited
- Required very frequent dosing



Routes of Administration cont.

A key factor in discussing routes of Administration is the bioavailability of the medicine:

Prescriber delivered:

- Intravenous Ketamine: 100%
- Intramuscular: about 95%

Can be done without prescriber in session:

- Intranasal: about 8-45%
- Oral (troches or rapid dissolving tablets): about 17-29%



FDA and ketamine

“There is no FDA-approved ketamine nasal spray product. Compounded drugs are not FDA-approved, which means FDA has not evaluated their safety, effectiveness, or quality prior to marketing. Therefore, compounded drugs should only be used in patients whose medical needs cannot be met by an FDA-approved drug. The dispensing of compounded ketamine nasal spray for home use when safe and effective dosing for psychiatric indications has not been established may place the patient at risk for serious psychiatric adverse events, misuse, and abuse. Healthcare professionals should be advised that animal studies have shown an association between racemic ketamine and brain lesions, and that the implications of the animal findings to humans are unknown. FDA recommends that healthcare professionals be aware of the potential risks associated with compounded ketamine nasal spray.”

Content taken from FDA website dated February 16, 2022



Different Medicine Assisted Therapy Experiences

Psychedelic

- Allows for states of consciousness beyond ego
- Client undergoes a full psychedelic experience with lessened ability to talk during the experience

Psycholytic

- Maintains ego defenses
- Client undergoes a partial psychedelic experience with greater ability to talk and process with the therapist during the experience

Ketamine Infusion / Pharmaceutical Intervention

No emphasis on psychedelic experience, no therapist is present, and dose may be high enough to leave a client unable to speak and with little memory for the psychedelic experience



Contraindications

- Psychosis or active mania
- BPD
- Lamictal, Benzos (Xanax, Ativan etc) and Stimulants (Adderall) *Hold on dosing day
- Uncontrolled hypertension/ untreated heart conditions/risk for stroke
 - Currently a rule out can be high blood pressure because during treatment blood pressure can increase
- Active substance abuse
- Pregnancy
- Sleep Apnea
- Recent TBI
- Untreated seizure disorder
- Recent eye surgery



Side Effects

- ▶ Possible addiction issues are being researched, but studies are showing low chance of addiction issues when ketamine is used in a medical setting
- ▶ Ketamine Induced Cystitis

Some side effects occur during treatment but they rarely happen in between treatments

- Nausea/Vomiting
- Hypertension during session returns to normal within 4 hours of treatment
- Unsupported difficult experiences
- Treatment emergent agitation/confusion
- Altered pain perceptions
- Urinary urgency (long term use and abuse can increase risk of ketamine induced cystitis)

After effects

- People should not drive until the next day
- Nausea
- Headaches
- fatigue



Benefits of Ketamine versus other psychedelics

- ▶ *Similar in experience to other psychedelics and usable when other psychedelics are not*
 - ▶ Other psychedelics are only available outside of the country (some states now) or through scientific studies
 - ▶ Other psychedelic therapies often take a full day
 - ▶ Other psychedelics can sometimes feel more intense
- ▶ *Broadly available medication and inexpensive*
 - ▶ Because its patent has expired
 - ▶ Less time commitment makes it less expensive than other psychedelic therapies being researched at this time
- ▶ *Supports a growth mindset*
 - ▶ Medicine enhances a more therapeutic mindset
 - ▶ Often clients will naturally move towards the topics that they have been stuck on in their lives, but they have a new take, a new perspective they can feel open to
 - ▶ Knowing becomes embodied



How you can support your Clients

Communicate with the Ketamine Team

Receive your own training in supporting psychedelic therapy

Use the openness and insights brought on from the treatment to work on your clients relationships, life changes, and insights

Support your client in finding footing in the psychedelic space

- Let them know that they will be working hard on themselves
- Neutral, non-judgmental, curiosity
- Open to clients coming back with experiences that feel spiritual to them
- Inquisitive and affirming

Encourage your client to have a deep relationship with their KAP provider



KAP Elements

- Relationship with a prescriber
- Preparation-informed consent necessary at preparation, discuss expectations, discuss therapeutic touch, provide paperwork
- Set and setting- set intention, setting should include basic safety components (staff trained in first aid/cpr, defibrillator, oxygen, etc.) Setting also needs to be comfortable for laying for 45 min-2 hours. Clients will not be able to drive themselves home.
- Integration- discuss if this will happen at the end or in a separate session
- Safety for clinician and client in non-ordinary states of consciousness (know the client's trauma background)



How to know if your client is ready for KAP from the PPS...

Support and Planning Questions:

- I had prepared some strategies in case things started to get difficult during the psychedelic experience.
- I had made a plan for what I would do in the hours and days after the psychedelic experience.
- My family and/or friends were prepared and well-informed about the changes that could occur in me.
- I felt the substance would be safe to take.
- I felt a trusting, positive connection with the people who were going to be around me during the experience.



from the PPS continued

Intention/Preparation

- I engaged with specific preparation practices before the psychedelic experience (e.g., meditation, yoga, breathwork, journaling, diet, exercise)
- I spoke with a therapist/counsellor as part of my preparation for the psychedelic experience.
- I had carefully contemplated my reasons for taking a psychedelic substance.
- I had a clear intention for the psychedelic experience.
- I trusted my own mind and body to safely process the experience.



from the PPS continued

Psychophysical Readiness

- I was prepared for the physical effects of the psychedelic.
- I felt psychologically prepared for the psychedelic experience.
- I felt ready to surrender to whatever the psychedelic experience would be.
- I was prepared to deal with uncomfortable and challenging aspects of the psychedelic experience.
- I was ready to experience whatever 'came up' during the psychedelic experience.



from the PPS continued

Knowledge-Expectation

- I was aware that the psychedelic experience might change me in some way.
- I knew that my experience would be somewhat unpredictable.
- I understood that events from my past could surface into the psychedelic experience.
- I understood that the experience could evoke a range of intense emotions, from bliss to horror.
- I had done some of my own research into the effects of the psychedelic substance (e.g., reading articles/books, watching videos, listening to podcasts etc.)



What does A KAP session look like without a prescriber present

1. greet the client and orient to space
2. double check that the client has not eaten within a few hours to discourage vomiting
3. take blood pressure, orient client to HR/O2 monitor
4. ask the client if they have zofran prescribed to them with them/ blood pressure medication prescribed with them
5. ask the client if they have the medicine with them
6. remind the client about therapeutic touch, touch for safety
7. take the medicine
8. put on eye shades/ headphones/start KAP playlist
9. sit near the client and make sure space is clear should you need to sit next to the client
10. have your own notepad/ book set up
11. thoughtful things to have in the session: fresh flowers, notepad/book, blanket, eye shades, headphones, electrolytes, water, tissues, emesis bag, pillows, drawing/coloring materials, snacks
12. emergency contact number handy, number for ride home if not the same person





Research on KAP

Difficult to interpret:

- multiple routes and frequencies of administration
- a range of diagnoses and patient demographics
- various models of psychotherapy integration
- varying research models





Ketamine Assisted Psychotherapy: A Systematic Narrative Review of the Literature Drozd, et al., 2022

- Various ROA, dosing and number of psychotherapy sessions
- 17 articles and abstracts involving 603 participants were identified and reviewed. Seven articles reported randomized controlled trials; five articles were case studies or case series; four were open-label trials; and one was a retrospective study
- The results showed significant decreases in anxiety and depression scores as measured by the Hamilton Anxiety Scale (HAM-A) and the Beck Depression Inventory (BDI). The most significant improvements were seen in those with developmental trauma (complex PTSD), severe depression, and in those who received more ketamine-assisted psychotherapy sessions (vs ketamine alone)
- In the treatment of substance dependence, the integration of ketamine and psychotherapy appears to promote abstinence initiation, improve relapse prevention, improve craving reactivity management, and increase motivations to terminate drug-use in select individuals
- “Variability in study design, intervention structure, patient diagnoses, and outcome measurement, along with small sample sizes, limit firm conclusions.”



Ketamine Assisted Psychotherapy: A Systematic Narrative Review of the Literature Drozd, et al., 2022

Additional Considerations Noted in the Literature Reviewed:

- Aderka et al., 2012: Correlation of rapid gains (esp in CBT) with positive long-term outcomes.
- Increased engagement, lower drop-out rates
- The transpersonal nature of the ketamine experience can address all aspects of the body, mind and spirit and all at the same time (Becker, 2014)

“Overall, it appears that higher doses of ketamine, more frequent KAP sessions, and longer durations of psychotherapy increase the efficacy and durability of improvements within patients with a range of disorders.”



Ketamine for the treatment of mental health and substance use disorders: comprehensive systematic review Walsh et al., 2022

- 83 published reports in this systematic review, comprising 33 systematic reviews (of which 17 included meta-analyses), 29 RCTs, two randomised trials with no placebo control, three non-randomised trials with controls, six open-label trials and ten retrospective reviews
- IV is the most widely used in clinical settings for bioavailability and control of dose but other ROAs have clear practical advantages for client comfort and repeated dosing
- Studies that have compared modes of administration have generally not reported meaningful differences in efficacy
- Ketamine effects in depression generally last from a few days to 2 weeks, so repeated dosing is usually necessary to extend recovery

“In general, further empirical work is required to confidently assert an optimal model of ketamine administration.”



Ketamine for the treatment of mental health and substance use disorders: comprehensive systematic review Walsh et al., 2022

- The authors point out that psychotherapeutic support has not been emphasized in the current psychiatric use of ketamine.
- And that this is in contrast to early uses of KAP for substance abuse, where psychodynamically oriented groups were used with ketamine administration.
- In assessing these early substance abuse programs, it was suggested that the psychotherapy component was key to their effectiveness.
- The authors noted that, even in addiction treatment, no studies reported a transition to illicit use of ketamine after introduction in the therapeutic process.



Current Research on Treatment of Mental Health Disorders



Research Limitations

BIPOC populations
are under-
represented

(Michaels, et al., 2021)

- In spite of NIH's 1993 Revitalization Act, requiring equal representation of women and ethnorracial groups
- When there is a great need for novel paradigms and improved dissemination of effective treatments
- May be fears of consequences of drug use and/or the (understandable) distrust of researchers
- Need for collaborative efforts with community members to improve recruitment



Research Limitations

- Some indication that Black Americans benefit less from psychedelic use than White individuals because the set and setting is affected by pervasive psychosocial stressors (Vina et al., 2023)
- There is a high salience of culture in the KAP experience, with a need to incorporate issues of race, culture, stigma, ritual, and socioeconomic status into treatment planning and outcome research. (Rojas et al., 2024)
- Overall, the research generally uses a individual-centered Western approach and does not consider the unique traumas and stressors that impact non-White, low SES populations.

George et al., 2020: limitations of a White-dominant medical framework



Depression





Multiple RCTs provide efficacy for depression

Specific to esketamine and
depression:

Papkostas et al., 2020

Rodolico, et al., 2024

McGirr et al. 2015 Meta-analysis:

7 RCTs, 183 subjects with BD and MDD

Single administrations of ketamine are
efficacious in the rapid treatment of unipolar
and bipolar depression.

McIntyre, et al. 2020 Meta-analysis:

Meta-analysis of 21 RCTs, depressive
disorders treated with IV, IN and oral

The short-term efficacy of intravenous and
intranasal ketamine/esketamine for adults
with TRD was established.

(See also Kryst, 2020)



What about its
effectiveness?

Alnefeesi, et al.,
2022

- 79 studies, 2669 patients
- Ketamine is significantly effective in TRD
- Persists across repeated treatments
- Considerable variability in the magnitude of ketamine's effectiveness
- Means: $45 \pm 10\%$ for response rates
 $30 \pm 5.9\%$ for remission rates
- Only one study showed a worsening of symptoms, 1.83–5.49% of patients
- Less consistent but clinically significant anti-suicidal effect



Bipolar Depression

Efficacy and Effectiveness

Systematic review of IV ketamine for bipolar depression showed that 61% of participants achieved a response.
(Bahji et al., 2021)

Systematic review of IV ketamine for bipolar disorder showed efficacy but a need for larger sample sizes.
(Joseph, 2021)

Community clinic with bipolar I/II, IV repeated doses showed statistically and clinically significant anti-depressant effects.
(Fancy et al., 2022)



Suicidal Thoughts and Behaviors



- Compelling evidence for short-term benefit with IV ketamine but not intranasal
- Full remission in 30-60% of cases after one infusion
- No difference according to TRD or bipolar vs unipolar
- Ketamine's role in a multimodal care strategy still needs to be established.

(Jollant et al., 2023)



Cognitive Behavioral Therapy to Sustain the Antidepressant Effects of Ketamine in TRD: A Randomized Clinical Trial Wilkinson et al, 2021

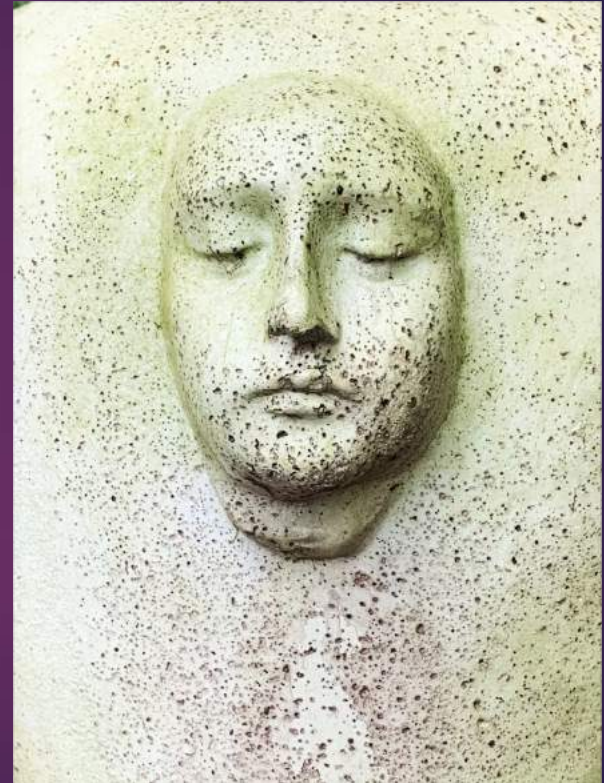
- 42 clients with TRD
- 6 IV sessions over 3 weeks (no CBT during this time)
- Responders (>50% improvement in depression severity) randomized to CBT or TAU for an additional 14 weeks

28 (67%) achieved response and were randomized

Greater sustained improvement in the CBT group



PTSD





Borgogna, N.C. et al, 2024

Systematic review and meta-analysis

Important findings:

- 1) The effect of ketamine compared to all controls was weak. With trial biases factored in, no significant difference.
- 2) There were discrepancies between clinician and patient ratings for PTSD symptoms.
- 3) Future studies utilizing more commonly employed control interventions would be helpful.
- 4) The confounding role of psychotherapy adds an additional layer of complexity.



Almeida, et al., 2024
Systematic review
and meta-analysis:

- 10 studies (5 RCTs, 3 non-randomized), 363 individuals with a primary diagnosis of PTSD
- Mean baseline PCL-5 score was 51.88
- Ketamine vs control groups, improvement in PCL-5:
at 24 hours post-ketamine: 29.15 vs. 25.63 points
at endpoint of treatment: 30.85 vs. 22.06 points
- no psychotic or manic symptoms, no exacerbation of PTSD-related symptoms



A Randomized Controlled Trial of Repeated Ketamine Administration for Chronic PTSD

Feder, et al, 2021

- 3 infusions/week for 2 weeks
- 30 participants, 1/2 got ketamine, 1/2 got midazolam
- Measured with CAPS-5 and MADRS (for depression)

Total CAPS-5 scores were significantly lower in the ketamine group when compared to the control group at week 1 (by 8.8 points) and at week 2 (by 11.88 points)

Significantly more participants in the ketamine group (67%) attained response (>30% reduction from baseline) at week 2 compared with those in the midazolam group (20%).

Significantly greater improvement in MADRS scores in the ketamine group.



A Double-Blind, Randomized, Placebo-Controlled Multi-Center Clinical Trial
Abdallah et al., 2022

Findings:

- No significant effect of treatment. PCL-5 scores improved over time for all.
- No significant difference in CAPS scores between active doses and control
- Percentage of responders (>25% improvement) at 24 hrs was higher in both active groups than control
- A significant improvement in MADRS scores with standard dose after 24 hrs and at treatment end compared to control, also better than low dose
- Low dose group had improvement on MADRS by study end compared to control
- Repeated doses well tolerated



Trials with psychotherapy

Shiroma, et al., 2020: Ketamine with Prolonged Exposure

Significant changes in PCL-5, MADRS and CAPS-5

After controlling for MADRS change over time, changes in total PCL-5 and PCL-5 Avoidance were still significant

Dames, et al., 2022: KAP for Healthcare Providers

91% saw improvements in generalized anxiety, 79% saw improvements in depression, 86% of those who screened positive for PTSD screened negative at treatment end, and 92% had significant life/work functionality improvements.

“Qualitative feedback was overwhelmingly positive, with several unsolicited self-reports of transformation.”



Trials with psychotherapy

Pradhan, et al., 2018: TIMBER (Trauma Interventions using Mindfulness Based Extinction and Reconsolidation)

All the patients experienced a definable and significant remission of symptoms at 24 h reflected by a > 60% reduction in both the PCL and CAPS scores. No significant differences between the two arms of the study at 24 h → Mindfulness protocol contributed to the response.

Comparison of the duration of sustained response between the two treatment arms indicated that the effect was significantly greater in the TIMBER-K arm (34.44 ± 19.12 days) relative to the TIMBER-P arm (16.50 ± 11.39 days),

“In the current study, patients receiving TIMBER-K therapy experienced no or minimal PTSD symptoms for an average of 34 days, which is twice as long as the sustained remission achieved with mindfulness therapy alone and 5-fold longer than the reported response to Ket therapy alone “



Substance Use Disorders, OCD and Anxiety





Substance Use Disorder

Walsh et al., 2022:

- Studies consistently show longer periods of abstinence and decreased cravings after ketamine treatments vs controls
- Ketamine-induced mystical (but not dissociative) experiences mediated the reduction in cravings
- Ketamine useful in managing alcohol withdrawal syndrome

Martinotti et al., 2021:

- Promising evidence that the integration of mindfulness-based and motivational enhancement therapies can aid in initiating and sustaining abstinence
- High doses and multiple session of ketamine administration resulted in higher rates of 1-year abstinence and lower cravings



OCD

Martinotti et al., 2021:

- significantly improves symptoms quickly but short-lasting (days to weeks)

Bandeira, et al., 2022:

- significant improvement, some speculation that there is a higher response rate when no comorbid MDD (consistent reduction in depression symptoms when comorbid)
- ketamine followed by 10 sessions of exposure-based CBT showed varying results for extending the benefit of ketamine, from complete remission to no benefit
- some indication that repeated doses followed by psychotherapy can raise response rates and extend benefits



Anxiety

Tully et al, 2021 & Whittaker et al., 2021:

- significant results at 48 hours, nonsignificant at 7 day follow up
- irritability and panic most changed, generalized anxiety unchanged
- higher doses led to greater improvement on self-report measures
- repeated doses of 2x weekly for 3 months showed continued improvement via self-report



Training



What To Consider if you want to become a KAP therapist



1: Growing field with many uncertainties



2: Community Work



3: Collaboration



4: Difference in Time Commitment



5: New Therapeutic Skills/ Core competency



6: Personal Growth



If you decide to pursue KAP training

Trainings

- Some focus on KAP alone - These tend to be fairly short and need supplemental work.
- Some focus on psychedelics in general - Have more detail and also tend to share other areas that you may want to know in the future.
- It is recommend that you look for a training that is several months to a year long and includes an in-person, experiential training



Ketamine training opportunities for clinicians: Ketamine, Psilocybin, & MDMA

Integrative Psychiatry Institute Boulder, Colorado \$10K/\$3K psilocybin/\$1500 ketamine

- 256 hours of learning/80 CE
- one year training
- post graduate training certificate
- 90% live virtual learning
- optional in-person ketamine training practicum
- optional in-person psilocybin training practicum
- optional MAPS PBS/Lycos training

Naropa Boulder, Colorado \$7,500/MDMA practicum \$4000

- closed for 2024
- 150 hour of virtual learning
- not just for clinicians, also avail for native american/ indigenous people, acupuncturists, Lawyers, etc.
- Post graduate training certificate



Ketamine Assisted Psychotherapy Training Opportunities

- **Alchemy Community Therapy Center-** Oakland, CA \$2100
 - 7 week program/36 virtual hours/no practicum
- **Fluence-** New York City, NY \$2500
 - 6 week program/ live online training/ no practicum
- **Polaris Insight Center-** San Francisco, CA \$2724
 - virtual/6 modules/48 hours/ 3 Advanced Modules \$1362/ Special topics series including ethics, integration, ACT, Music, Healing the healer
- **PRATI-Psychedelic Research and Training Institute-** Fort Collins, CO \$3300 clinicians \$4750 prescribers
 - in person training 4 days practicum included/ +Business of Psychedelic Medicine Training available two workshops \$299/\$249/ +Group Ketamine Assisted Psychotherapy Workshop 5 days \$3400
- **Roots to Thrive-** Vancouver, British Columbia \$3500
 - basic level of training in psychedelic medicine plus two years clinical experience required/52 hour hybrid training/ 4 days in person in Vancouver Island British Columbia



Ketamine Assisted Psychotherapy Training Opportunities cont.

- **Living Medicine Institute-** Asheville, NC
 - KAP Retreat \$3200/3 day retreat/ practicum experience/ two ROA's included in experience
 - Level One Training \$6000/ 16 week intensive online/ 7 experiential sessions/travel required
- **Ketamine Training Center-** Phoenicia, NY \$3000 therapist/\$3500 prescribers
 - Fundamentals of KAP 5-6 day training in person experiential
 - *BIPOC scholarships available



photo from Living Medicine Institute



"Ketamine offers both the potential to more effectively treat those suffering and a catalyst for profound and much needed shift in our paradigm of mental health care"

Scott Shannon, MD



Resources

- ▶ KAP Community Resources
 - ▶ Kriya Institute : Ketamine Research Institute
 - ▶ <https://www.krivainstitute.com/>
 - ▶ ASKP: American Society of Ketamine Physicians, Psychotherapists & Practitioners
 - ▶ <https://www.askp.org/>
 - ▶ MAPS: Multidisciplinary Association For Psychedelic Studies
 - ▶ <https://maps.org/>
 - ▶ Psychedelic Medicine Association
 - ▶ <https://psychedelicmedicineassociation.org/>
 - ▶ American Psychedelic Practitioners Association
 - ▶ <https://www.thepsychedelicassociation.org/>
 - ▶ Psychedelic Support
 - ▶ <https://psychedelicsupport.org/>
- ▶ Introduction to KAP, presentations :
 - ▶ **What You Need To Know About Ketamine As A Therapist:** <https://askp.org/january-2022-webinar/>
 - ▶ **BPRG interviews Raquel Bennet on KAP:** https://www.youtube.com/watch?v=YQ5GGFhoNaE&ab_channel=BPRG



Palliative Care

The reviewed case studies of palliative care patients show that depression comorbid with severe, life-threatening physical ailments is significantly reduced with ketamine, alongside persistent relaxation and the patient's greater hope for the future, and while these patients experienced a relapse in anxiety and depression symptoms, their subsequent reports were less severe than pre-ketamine intake.



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