Synthetic Cannabinoids

AKA: *Spice, Mamba, Man Down*
This family of drugs work on **cannabinoid receptors** in the brain and body, so are referred to as **Synthetic Cannabinoid Receptor Agonists (SCRAs).** Although accurate, the term isn't widely used outside of the scientific community and so the term Synthetic Cannabinoids is often used as it's less of a mouthful.

When doing drug education, it is important to stress the issues and risks with SCRAs are very different to plant-derived cannabis. Participants should not get the impression that these products are just synthetic versions of the chemicals in cannabis.

Drug Families include:

"Classic Cannabinoids"	HU-210
Napthoylindoles:	JWH-004, JWH-018, AM2201 (etc.)
Naptheylmethylindoles	JWH-073, JWH-200 (etc.)
Naptheylpentylindoles	THJ-018, SDB-005, NM2-2201
Napthoylpyrroles	JWH-398, AM-1221
Napthylmethylindenes	AM-2201, AM-694, WIN-55,212-2
Phenylacetylindoles:	JWH-250, JWH-251, JWH-203, RCS-8
Benzoylindoles:	AM-694, AM-1241, AM-2233, RCS-4
Cyclohexylphenols:	CP-47,947 CP-55,940
Cyclopropanoylindoles**:**	UR-144, 5F-UR-144, A-834,735, A-796,260
Napthoylpyrroles**:**	JWH-307, JWH-147, JWH-030
Adamantoylindoles	5f-AKB-48, APICA, STS-135
Indazole carboxamides	AB-PINACA, AB-FUBINACA
Quinolinyl esters	PB-22, 5F-PB-22

[*these lists are not comprehensive; there are hundreds of different SCs now on the market.]*

Naming of synthetic cannabinoids is confusing. Some chemicals emerged from laboratory research into cannabinoids and compounds were given reference codes from research.

For example compounds developed by John William Huffman in America were given the initials JWH, followed by a number (e.g. JWH-018.) Other early products included:

HU-: Hebrew University
AM-: Alexandros Makriyannis
CP-: Carl Pfizer

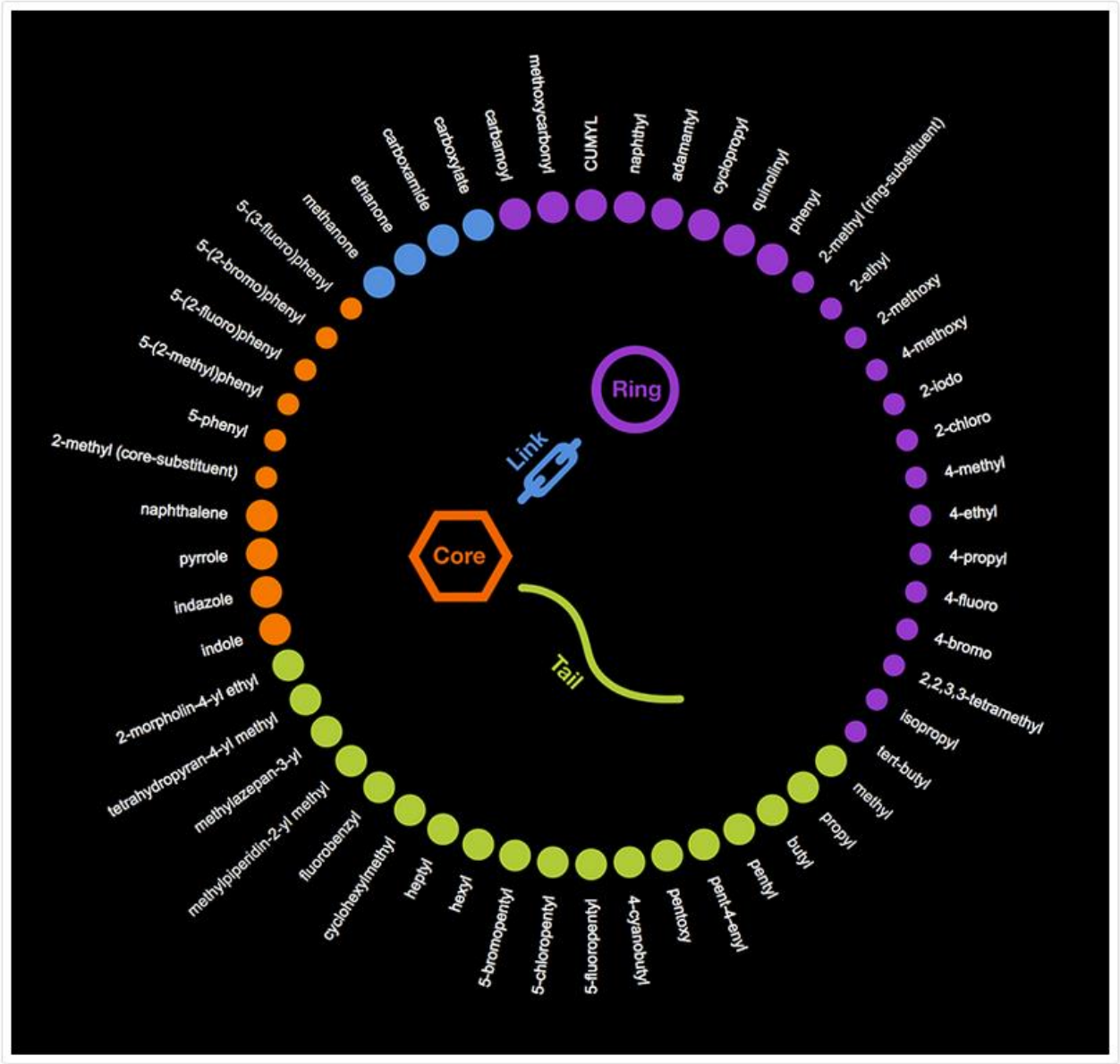
Each compound has a long chemical name, possibly more than one.
There is an "official" name based on an international naming standard (IUPAC). But some drugs end up with unofficial names too, and abbreviations derived from these unofficial names.

The names linked to the drug **AKB-48** are a good example.

The 'official' name is: *1-pentyl-N-tricyclo[3.3.1.13,7]dec-1-yl-1H-indazole-3-carboxamide*
but it is also known as *N-(1-**a**damantyl)-1-**p**entyl-1H-**in**d**a**zole-3-**ca**rboxamide*.
This unofficial name led to an abbreviated name of APINACA derived from its chemical name.

@nticopyright: copy and share w/ acknowledgement

The EMCDDA has a very helpful interactive tool which illustrates how SCRAs have been constructed from different chemical cores, links, rings and tails. It helps to illustrate how the different names emerge from this structure. It can be found here: http://www.emcdda.europa.eu/media-library/interactive-demystifying-chemistry-synthetic-cannabinoids_en



And why AKB-48 in the first instance? Possibly because it was derived from an earlier compound called AB-001. AKB-48 was first reported in Japan in 2012 and there's a Japanese girl band called AKB-48 so maybe it was named after them. Who knows?!

Overview – "potted" history: Synthetic cannabinoids have been on the market since around 2007, but for a fair while their presence wasn't widely reported. "Herbal smoking mixtures" such as Spice or Aztec Gold were offered by head-shops and on-line sellers as an alternative to cannabis.

@nticopyright: share with full acknowledgement

This, in turn was nothing new. Head-shops had, for years been selling “smoking mixtures,” usually a mixture of plant material with loosely psychoactive properties. Such mixtures generally resulted in a headache, sore throat and a house that smelt like an autumnal bonfire with little if any psychoactive effects. The newer compounds like Spice were different – they worked and so interest and use started to increase.

Analysis of samples of Spice revealed that, rather than being a blend of herbal smoking mixtures, the products were inert plant material, which had been sprayed with a **synthetic cannabinoid** (initially JWH-018) – a chemical which mimicked the action of THC or CBD at cannabinoid receptors in the brain.

These synthetic cannabinoids were originally being used in research settings. They were synthesized by researchers in different settings – such as compounds developed in the mid-eighties by John Huffman. It was a couple of these, including JWH-018 which cropped up in the Spice and Aztec Gold smoking mixtures.

This was made a Controlled Drug in 2009, but a new product “Black Mamba” emerged, which contained AM-2201 which in turn was made a Controlled Drug in 2013.

After this, and up to the Psychoactive Substances Act (2016) the market expanded, more and more branded products appeared including **Pandora’s Box, Exodus Damnation, Cherry Bomb, Sensate, Vertex** and many others.

These branded products included the next wave of SCRAs, especially AKB-48, 5F-AKB-48 and PB-22. These, and other chemicals, were designed specifically for the “legal highs” market rather than being repurposed from research.

The Psychoactive Substances Act brought an end to these branded products, as there were no longer legal avenues for sale such as headshops.

@nticopyright: share with full acknowledgement

Illegally imported and distributed synthetic cannabinoids continues to enter the UK and is now generically referred to as "***spice***" or "***mamba***," a reference back to the earlier branded products but containing different chemicals.

Time-line and Law: The range of synthetic cannabinoids on sale in the UK has changed several times. In order to address each emergent group of drugs, amendment were made to the Misuse of Drugs Act but, predictably newer (and frequently more toxic) compounds emerged that were not covered, requiring further legislative changes.

There have been three (or four) "generations" of cannabinoids, and within each "generation" a range of different compounds have been available.

The majority of SCRAs are covered by the Misuse of Drugs Act by one of the 2009, 2013 or 2016 amendments. However, the legislation is now complex and requires a good understanding of the molecular structure of newer synthetics to be certain if they are covered by the amended legislation.

Any emergent Synthetic Cannabinoids not covered by the Misuse of Drugs Act will be covered by the Psychoactive substances act, making production, importation and supply an offence but meaning possession is only prohibited in custodial settings.

	Date	Key Compounds	Products	Legality
1st Generation	2007-2009	JWH-018 HU-210 WIN-55,212	Spice Gold	Class B CD December 2009 [HO Circular 3209/2009]
2nd Generation	2010-2013	AM2201 (and others)	Black Mamba	Class B CD Feb 2013 [HO Circular 239/2013]
3rd Generation	2013-2016	AKB-48, 5F-AKB48 MDMB-CHMICA PB-22, 5F-PB22	Pandoras Box Clockwork Orange etc	Class B December 2016 SIs: 2016/1109, 2016/1124 2016/1125]
4th Generation	2016...	5F-ADB (also known as 5F-ADB-PINACA) 5F-AMB, FUB-AMB AMB-FUBINACA MMB-CHMICA 5F-CUMYL PINACA FUB-2201 (and many others)	"Spice" "Mamba" (generic terms)	Some of the fourth generation SCRAs are not covered by the MoDA but will fall under the PSA (2016).

The Government had toyed with creating a novel definition to address synthetic cannabinoids by creating legislation that reflected where the drug worked rather than its chemical structure. The idea was that any drug that acted as a CB1 receptor agonist would have been covered, but, for reasons unknown, the Government appears to have abandoned this legislative route, preferring to use the PSA instead.

@nticopyright: share with full acknowledgement

Current Market [January 2019]**:**

Currently on sale on Dream Market

4Cn-BINACA-ADB	AMB-CHIMANACA	5C-APB
SGT-151	THJ-2201	PP-ADB
5F-MDMB-2201	FUZ-AMB	PY
4F-ADB	FUB-EMB	SDB-001
MAB-CHMINACA	FUB-2201	5F-AXB
5C-AKB-48	M-PHP-2201	5CL-ADB-A
SGT-67	NM-2201	ADB-FUBINACA
SGT-78	JWH-X18	5F-CUMYL PINACA
SGT-263	4-BB-22	5,3-AB-CHMFUPPYCA
5F-ADB (5F-MDMB-PINACA)		

Notifications from EMCDDA

5F-AKB-57	5F-AB-P7AICA	AMB-4en-PICA
Cumyl-CH-MeGaClone	WIN-35428	DMBA-CHIMANACA
4F-MDMB-BINACA	MPhP-2201	MBA-CHIMANACA
APP-BINACA	2F-QMPSB	

Offered by labs but not appearing on Dream Market

MMB-FUB	SGT-151
MMB-022	5F-SGT-151
EG-018	

Trends: We have very poor trend data in relation to use of SCRAs. Prior to 2009, when the first-generation drugs were scheduled under the MoDA, they were not considered under the Crime Survey of England and Wales (CSEW) as were not CDs. They were also associated with overdoses or deaths, were not recorded via crime or hospital statistics.

We have better monitoring now of hospital admissions and deaths but it's unclear if increases in figures are a result of more incidents or better recording and monitoring of such incidents.

According to the CSEW around 1.2% of 16-24 year olds reported use of NPS in 2017-18, unchanged from the year before. 33% of those who had used and NPS said it was a "herbal smoking mixture."

However, the CSEW is a poor tool for assessing SCRA use as it excludes prisoners and homeless populations, the two key demographics where use of SCRAs is widespread.

SOURCE: Raw "spice powder" is produced in overseas laboratories for non-scientific use. Imported in to UK directly from manufacturers or via Dark Web drug markets then prepared for street sale.

There have been claims, especially in custodial settings, that home-made "spice" has been made in domestic setting in the UK out of household products. These claims are highly dubious: while some of the earlier SCRAs were relatively easy to make, the precursor chemicals are not

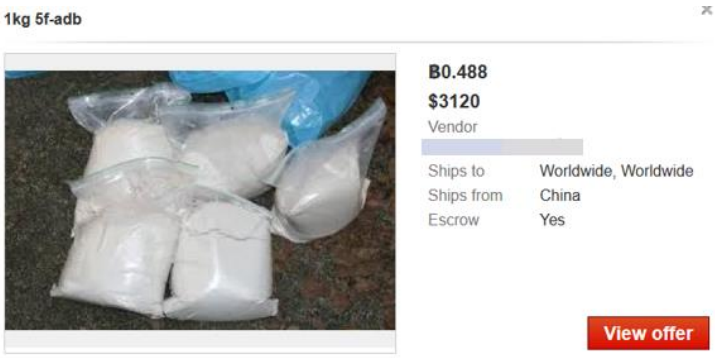
@nticopyright: share with full acknowledgement

household products or readily available. Claims therefore that “spice” can be made in Prison workshops are therefore not credible,

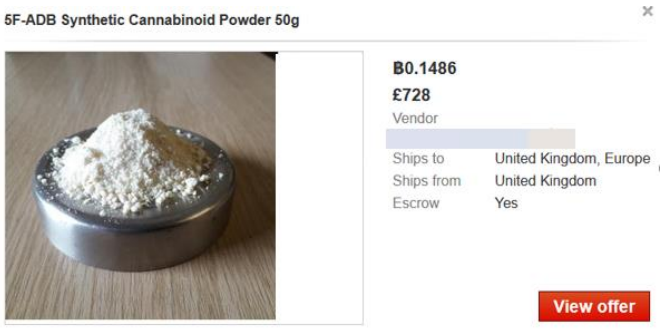
APPEARANCE: Synthetic cannabinoids are sometimes available in street settings in a ‘raw state’ as crystalline white or brown powder though this is not the most common form. This would be very potent and would in turn be mixed with tobacco or another smoking mixture for consumption. Deaths occurred in Manchester where raw SCRA was sold mistakenly for MDMA, and taken in fatally large doses.

Raw spice powder: as sold on-line via Dark-web retailers.

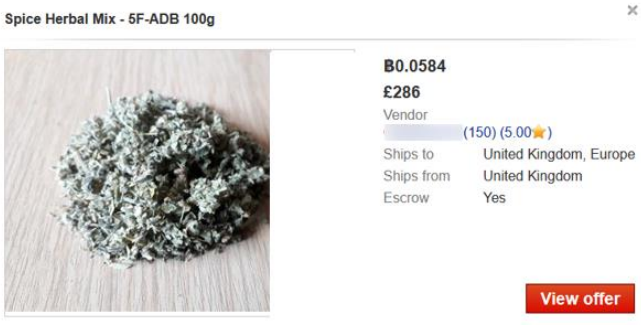
Average potency of 1g herbal spice is 10mg 5F-ADB. So 1g 5F-ADB makes 100 average doses. Each 1g bag sells for £5-10.



Wholesale price: 1000g @ £2500. £2.50/g. Makes up 100,000 doses, around £500,000 worth of street drugs.



UK retailer. 50g @ £728/g £14.56/g. 5000 doses at £5/dose = £25,000



The imported spice powder is dissolved in a solvent, usually acetone and sprayed onto an organic herbal material for sale.

In liquid form it can also be used to impregnate paper for sending in to prisons or sold in diluted liquid form for vaping.

COSTS: Street deals of herbal “spice” sell for £5-10/g. In custodial settings prices can be much higher.

@nticopyright: share with full acknowledgement

COMPOSITION, QUALITY, STRENGTH and DOSES:

As with all illicit compounds, the person using the substance can never be certain what they are taking.

This is certainly the case with synthetic cannabinoids. The active chemicals sold in the UK have changed several times and so users cannot be certain:

- Which chemical or chemicals are present on the product they have bought
- The concentration/quantity of drug on the material.

There is very little published, systematic data about what is in "spice" sold on the streets. Some local research (for example in Manchester in 2017) showed four different chemicals present in 8 samples of 'Spice' and massive variance in dose strength.

One product containing AMB-FUBINACA contained 1.2% drug while another sample contained 4.5%. This sort of variance, in the same City in the same month, goes some way to explaining how easy it is for unwitting users to take more of a drug than intended, or be given a substance that is unfamiliar to them.

A year later, further research in Manchester showed that the substances on sale in 2017 had largely vanished from the market. 24 of 26 samples instead contained the drug 5F-ADB. Again, doses varied massively: 0.19mg/g to 37.8mg/g with a median of around 10mg/g.

These results are location and time specific and no similar research has been undertaken and made available in the UK so we do not know the composition or potency of much of what is sold in the UK as Spice or Mamba.

Having said this, even if people knew which products they were specifically were using, the lack of detailed information about differences between specific products would mean that additional substance-specific harm reduction information would be thin on the ground. We can only talk in general terms about synthetic cannabinoids at this stage.

> Synthetic cannabinoids are often much stronger than their natural counterparts. Starting doses need to be much smaller. Different synthetic cannabinoids vary dramatically in terms of potency. Different blends of spice/mamba will vary in terms of the drugs that they contain and the amount of drugs on the smoking material.
>
> It is therefore essential to start with a **very low tester dose** to assess strength of each batch. Increase doses very cautiously. The gap between a tolerable dose and an overdose may be very narrow.

- Starter doses to assay strength and for those unfamiliar with synthetics should be no bigger than the head of a match. This should be mixed in with smoking material but NOT herbal cannabis. If being smoked in a pipe or bong, even smaller quantities may be indicated.

- Potency may increase as people get to the bottom of the bag. If the psychoactive material is not firmly bonded to the smoking mixture, it can lead to "bottom of the bag"

@nticopyright: share with full acknowledgement

syndrome, where active ingredients can shake off and become concentrated in the bottom of the bag and can be unexpectedly potent.

There have been warnings from Police, custodial settings and drugs agencies suggesting that synthetic cannabinoids have been adulterated with opiates and claims that fentanyl-family drugs have been added. These suggestions have not been confirmed by toxicology reports and so suggestions of "fentanyl in spice" should be treated with great caution and not recirculated without confirmation. Critical incidents related to SCRAs are more likely to stem from taking a large quantity of a potent SCRA or using a stronger product than expected than from the addition of fentanyl.

METHODS OF USE: In community settings synthetic cannabinoids are usually smoked as spliffs – mixed in with tobacco and smoked. As very small quantities of synthetic material are required to achieve intoxication, smoking "straight spliffs" of smoking mixture alone without tobacco is not recommended.

Synthetic cannabinoids and are also used in pipes and bongs. Given their relative potency and the small quantities needed to achieve intoxication, care is needed when using pipes or bongs to avoid unpleasant overdose experiences.

With an increased availability of e-liquids some people will vape rather than smoke their synthetic cannabinoids. This has also happened to some people inadvertently. There have been some cases of people buying CBD e-liquid (which would be legal and have little if any psychoactive effects) but finding that the liquid contained Synthetic Cannabinoids (illegal and highly psychoactive.)

As tobacco-free initiatives have been rolled out in Prisons, prisoners have adopted new techniques. This has includes adding spice to dried teabags (especially mint tea according to several sources) or "adapting" the chamber of e-cigarettes to allow the use of spice in liquid forms.

Anecdotal reports of snorting and injecting raw Spice powder have not been substantiated. Given the rapid, high levels of intoxication achieved through smoking and the poor water solubility of most of the synthetic cannabinoids currently on the market, it seems unlikely that snorting or injecting would be very efficient.

There have also been a small number of reports of synthetic cannabinoids being used orally but this does not seem to be commonplace.

MECHANISM OF ACTION: We do not fully understand how synthetic cannabinoids work, or all their points of action.

THC is one of the naturally-occurring chemicals present in herbal cannabis and cannabis resin. It is involved in the euphoria associated with cannabis use but may also be involved in less pleasant effects such as panic, paranoia and mental health problems. In 'traditional' strains of cannabis, THC is joined by other compounds including CBD, which is believed to play an important role in the anxiety-reducing, relaxing effects of cannabis.

THC and CBD bind to and activate **cannabinoid receptors** in the brain – CB1 and CB2 receptors.

@nticopyright: share with full acknowledgement

Early emergent chemicals, such as HU-210 were primarily active at the CB1 cannabinoid receptor and demonstrated much higher levels of affinity for these receptors than "natural" THC from cannabis plants. Some synthetics are thought to be 100 x the strength of THC. They may also have different affinities – binding more selectively to receptors in one part of the brain or body rather than others.

Later generations of synthetic cannabinoids act at CB1 receptors but may also interact with other brain processes. This could include:

- Possible impact of adamantine-related chemicals on dopamine levels
- Possible blocking of glutamate receptors, leading to ketamine-like dissociation, paralysis, and hallucinations
- Possible interaction with serotonin receptors via indole-derived drugs.

We know little about how newer synthetic cannabinoids work. We know still less how they work in combination, how they are metabolized, and how these processes will be affected by the presence of other drugs.

EFFECTS: The strength and composition of street synthetic cannabinoids varies significantly. It is not surprising therefore that the users experience can also vary. The mental wellbeing of the user, other drugs taken at the same time, the setting and other variable can also make for an unpredictable experience.

The sought-after effect is a euphoric, stoned, detached feeling. This could include altered perception, hilarity and a feeling of relaxation and calm.

Many users report unpleasant symptoms instead including anxiety, feelings of panic, disorientation and dysphoria – the opposite of sought-after euphoric feelings.

Some of these effects are probably an individual reaction to a specific drug or mix of drugs. For other people it is an 'overdose,' taking a larger amount than the person can cope with safely or enjoyably.

Unpleasant effects/risks:

Reported key effects/side effects of current synthetic cannabinoids include:

- very severe panic,
- fear-generated aggressive responses
- paralysis, rigid limbs
- uncontrollable limb movements
- convulsions
- inability to communicate
- profound hallucinations, including believed death experiences, detachment, depersonalization, derealization
- highly altered, delusional states (some of sufficient severity to warrant admission to psychiatric wards as acute patients,
- very fast heart rate, and conversely very low heart rate

@nticopyright: share with full acknowledgement

- respiratory distress following use including tightness of chest and tightening of the airways,
- loss of feeling and numbness in limbs,
- reduced sensitivity to pain
- impulsive behaviour
- loss of consciousness
- amnesia post incident
- elevated body temperature
- nausea
- vomiting
- loss of bodily functions

Reported in the past but not so many reports recently:

- kidney problems (associated with some batches in New Zealand primarily)
- severe coughing including coughing up blood (historic reports)

Associated with withdrawal:

- nausea and vomiting
- stomach and bowel pain
- shakes and sweats.

The environment in which synthetic cannabinoids are used and the delusional, impulsive state increases risks of accidents when under the influence. The paralysis and lack of recollection makes Spice users highly vulnerable and there are numerous reports of people under the influence of spice being assaulted, especially in street settings.

Fatalities related to synthetic cannabinoids?

According to the ONS, Synthetic Cannabinoids were recorded for 11 deaths up to and including 2015.

The total number for 2016 and 2017 was 51. This may be an under-estimate as synthetic cannabinoids won't show all show up on a routine toxicology screen and additional, expensive analysis will only be requested when there are grounds to do so.

The Prison Ombudsman notes 64 deaths in custody between 2013 and 2016 – a higher number than that recorded by the ONS. It notes 44 of these were "self-inflicted" and includes self-harming when intoxicated or suicide.

Nine deaths were attributed to direct toxic effects (e.g. heart failure, convulsions).

Dependency: Many users, especially less constant users in prison find that they can move off synthetic cannabinoids once their environment changes i.e. when removed from ready access to spice in prison and the pressures to use in a custodial environment.

However, a smaller number of prisoners and homeless users describe physical and psychological dependency.

@nticopyright: share with full acknowledgement

With regular, frequent use tolerance can develop, leading to escalating doses. With heavy use withdrawal symptoms have been reported including:

- intense craving
- hot and cold spells
- sweating
- stomach cramps, bowel pain
- dry heaving, nausea and vomiting
- irritability
- insomnia
- paranoia and anxiety
- neuralgic pain
- shakes tremors

The symptoms are described by some as being like heroin withdrawal, and some people say that it is worse than heroin withdrawal. There have been reports of some people self-medicating with opiates to alleviate withdrawal symptoms in lieu of proper structured treatment from drug services.

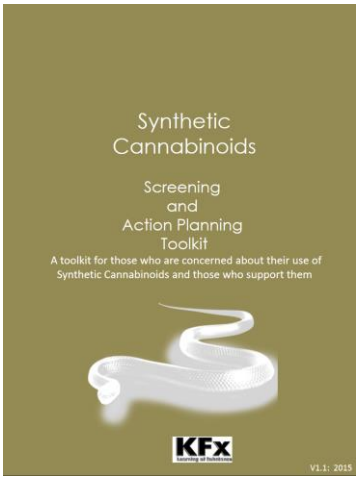
Treatment for dependency

There is no clear protocol for treating dependency on synthetic cannabinoids, and the limited available literature stresses the relevance of psychosocial interventions and holistic support as with other patters of drug dependency.

The Project Neptune report on the Management of Synthetic Cannabinoids says that symptomatic management of withdrawal symptoms may be indicated.

Synthetic cannabinoid users, especially those who are street homeless are likely to have multiple needs that will need to be addressed alongside dependency. This could include:

- Homelessness,
- Poor self-esteem and sense of self-worth: public and media perception of “spice-zombies” is likely to reinforce feelings of low self-worth and lack of capacity to change,
- Poor mental health,
- Challenging behaviour when intoxicated.



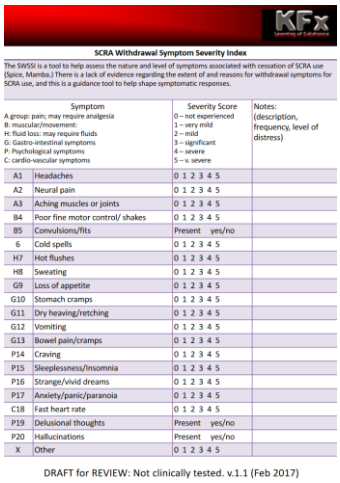
Joined-up interventions between outreach services, housing providers, drugs and mental services will be essential to provide a safe, therapeutic environment where dependent spice users can start to engage with services.

The KFx website has two resources exploring treatment.

The Synthetic Cannabinoid Toolkit can be used over a series of sessions to assess for dependency, develop motivation and plan change.

It can be downloaded from here:
http://www.kfx.org.uk/resources/SCRAst2015.pdf

@nticopyright: share with full acknowledgement



SCRA Withdrawal Symptom Severity Index

The SWSSI is a tool to help assess the nature and level of symptoms associated with cessation of SCRA use (Spice, Mamba.) There is a lack of evidence regarding the extent of and reasons for withdrawal symptoms for SCRA use, and this is a guidance tool to help shape symptomatic responses.

Symptom A group: pain; may require analgesia B: muscular/movement: H: fluid loss: may require fluids G: Gastro-intestinal symptoms P: Psychological symptoms C: cardio-vascular symptoms		Severity Score 0 – not experienced 1 – very mild 2 – mild 3 – significant 4 – severe 5 – v severe	Notes: (description, frequency, level of distress)
A1	Headaches	0 1 2 3 4 5	
A2	Neural pain	0 1 2 3 4 5	
A3	Aching muscles or joints	0 1 2 3 4 5	
B4	Poor fine motor control/ shakes	0 1 2 3 4 5	
B5	Convulsions/fits	Present yes/no	
6	Cold spells	0 1 2 3 4 5	
H7	Hot flushes	0 1 2 3 4 5	
H8	Sweating	0 1 2 3 4 5	
G9	Loss of appetite	0 1 2 3 4 5	
G10	Stomach cramps	0 1 2 3 4 5	
G11	Dry heaving/retching	0 1 2 3 4 5	
G12	Vomiting	0 1 2 3 4 5	
G13	Bowel pain/cramps	0 1 2 3 4 5	
P14	Craving	0 1 2 3 4 5	
P15	Sleeplessness/Insomnia	0 1 2 3 4 5	
P16	Strange/vivid dreams	0 1 2 3 4 5	
P17	Anxiety/panic/paranoia	0 1 2 3 4 5	
C18	Fast heart rate	0 1 2 3 4 5	
P19	Delusional thoughts	Present yes/no	
P20	Hallucinations	Present yes/no	
X	Other	0 1 2 3 4 5	

DRAFT for REVIEW: Not clinically tested. v.1.1 (Feb 2017)

Where physical dependency may be a significant issue, the Synthetic Cannabinoid Withdrawal Severity Index is intended to assess common withdrawal symptoms and look at potential interventions including medical management of symptoms.

It can be downloaded here:
http://www.kfx.org.uk/resources/SCRA_SWSI.pdf

Long term risks:

As the latest synthetic cannabinoids have only been available for a couple of years at most, we don't know enough about long-term risks and if these drugs will significantly increase risks of illness in the future. We don't know if the drugs will turn out to increase risk of cancers or other organ damage. Although there is no research evidence either way, any health risks are likely to increase with longer-term, heavier use so common-sense advice would be to use at lowest dose for the shortest period of time, and wherever possible reducing and stopping use.

We also don't know the impact of SCRA use during pregnancy, but again the best advice would be to avoid using during pregnancy and seek help if abstaining from SCRA use during pregnancy is difficult or a detox is required.

There is some evidence of long-term kidney damage linked to SCRA use. It is unclear if this was a direct consequence of the drug or solvent used in the preparation of the drug.

There have been reports of stroke-like symptoms after SCRA overdoses, possibly linked to impeded blood-flow during seizures. There is no published literature on this health issue.

Anecdotal evidence suggests that SCRA use is associated with poor mental health outcomes. Many users experience acute psychotic episodes during use, which usually resolve within 30-60 minutes but may persist for a few hours and in exceptional cases symptoms may persist for 48 hours or so.

There have been reports of chronic mental illness after SCRA use: this may have been over a sustained period of use but there have also been non-corroborated accounts of people experiencing long term mental health products after only brief experience of SCRA use.

It is not clear if these outcomes are caused by SCRA use causing the development of a mental illness *in novo* or if the drug is triggering or exacerbating an existing condition.

We do not yet know if use amongst young people will increase the risk of psychotic-type illness, as heavy use of strong cannabis appears to. However, it would not be unreasonable to assume such a correlation will be a risk.

@nticopyright: share with full acknowledgement

During acute episodes of spice intoxication, users can experience very high levels of panic and distress and may have a partial memory of the traumatic experience. However, as use is often associated with amnesia any recollection is likely to be incomplete. Some SCRA users describe flashbacks and moments of panic after using and it could be that these are akin to PTSD. The term “chemical-induced PTSD” could describe the flashbacks caused by delusional traumatic experiences caused by Spice, which the user can only partially recall after the event.

REDUCING HARM:

The scope for detailed harm reduction is hampered at present by:

a) A lack of information about which chemicals are present in any given batch of ‘spice’ on the streets and

b) Even if we did know which chemicals are present the lack of information about the short and long-term risks of these chemicals, and how they may interact with other substances.

It is not therefore possible to suggest if any of the various substances on the market are more or less safe than others. Likewise, we can’t speak with any certainty as to how safe or unsafe products may prove to be in the medium to long term.

In lieu of more detailed information only the broadest of harm reduction messages can be offered, including the following:

- There is no single product “Spice” or “mamba.” A range of different products are sold under these names and will vary wildly in terms of composition and strength;
- Potency is hugely variable: start with a very small dose (match-head size of less) and only escalate dose cautiously, giving time for previous doses to wear off;
- Contents of a bag may have “hot-spots” of concentrated drug or may get more potent towards the bottom of the bag.
- Treat each new bag as an unknown quantity even if bought from the same supplier;
- Be VERY cautious about using such compounds in bongs or pipes: it is harder to regulate intake and easy to take too much;
- If sourcing pure powder synthetic cannabinoids, only use very small doses, calculated using scales and thoroughly mixed in to smoking material;
- Don’t use in conjunction with other drugs, especially other forms of cannabis, alcohol or stimulants;
- There may be a risk of heart problems: you are best off avoiding these compounds if you have an existing heart problem or are using alongside stimulants or other drugs that affect heart rhythm;
- As synthetic cannabinoids may make anxiety and paranoia worse only use in an environment in which you feel safe, with people who you trust. Avoid using if prone to anxiety or have existing mental health problems;
- Try to avoid using in environments where you are unsafe, where you could fall or drown when intoxicated or could be assaulted by other people;
- Don’t drive or operate machinery when using these compounds.

@nticopyright: share with full acknowledgement

Managing acute episodes:

Symptoms of acute synthetic cannabinoid intoxication can present in lots of different ways and could look like other issues including:

- Seizures caused by epilepsy or other illnesses
- Withdrawal from alcohol, benzodiazepines or other depressant drugs
- An opiate overdose (though without characteristic pin-prick pupils)
- A psychotic episode

At present there is not "antidote" for a SCRA overdose, so the emphasis is to maintain the safety of all parties concerned and manage the symptoms, which typically wear off within 30-60 minutes.

Assess safety and lucidity. As with all first aid interventions, the safety of first-responders, bystanders and the patient need to be addressed.

- If the person is very altered, delusional and is also mobile and either panicking or aggressive they may represent a risk to themselves or others. They may not respond predictably to verbal cues, instructions or hazards. If they are in an environment which is dangerous (high buildings, busy roads etc) or acting in a way which poses a risk to others (violent, aggressive) then a response from Emergency Services may be required. Exceptionally the person may need to be restrained to prevent harm to them or others. Restraint should only be used when essential and needs to be supervised at all times so it can be removed if the person has convulsions, or if they have difficulty with breathing;

- **Reassure:** In other situations remove bystanders from the area and reduce the amount of sensory and verbal input that the person is receiving: one voice, speaking in a calming, reassuring way is more useful than a babble of removed voices talking about but not to the person. The person may not be able to verbally respond, and it may not be clear if they understand what is being said but direct simple reassuring sentences at the person, keeping tone calm and if possible using the person's name so they know you are talking to them.
- **Prevent falls:** If the person is upright, standing or sitting, trying to get them lying down if feasible to reduce the risk of harm if they fall;
- **Protect head:** If the person is on the ground, try to cushion the head to prevent injury if they have convulsions;
- **Manage convulsions:** In the event of seizures of convulsions don't attempt to restrain the person but move objects that could get in the way during a seizure. Medical interventions using anticonvulsants may be required if seizures are prolonged;
- **Recovery Position:** Where possible, place the person in the recovery position especially if they are experiencing nausea. This may be more difficult due to muscle rigidity. If it's not feasible to put the person in the recovery position, place them on their side, using clothing, cushions or pillows to support them in this position. Ensure that the airway stays open and unblocked and that any fluid or vomit can drain away.
- **Manage panic:** If the person is lucid but experiencing a high level of panic or anxiety, often treating as for panic attack will help resolve symptoms – sitting down, head down,

@nticopyright: share with full acknowledgement

regular breathing and reassurance. However more serious symptoms, including delusional behaviour or respiratory distress may require medical assistance;
- **Cardiac distress:** If the person has a long period of fast heart rate, or experience chest pains call an ambulance; do the same if heart rate drops dangerously low or if there is evidence of breathing difficulty.

Oranges and other interventions:
There have been numerous reports in custodial and street settings of oranges, orange juice or sugar water being used to "treat" spice episodes. An urban myth seems to have emerged that the vitamin C in orange juice can help reduce the severity of episodes. This may have been linked to the use of sugar solution in Dutch coffee shops to treat cannabis ODs or the urban myth that Vit C shortens LSD bad trips.

If someone is having a bad reaction to synthetic cannabinoids but is still lucid, can communicate and sit up, then having a sugary drink to sip may help. However, if the person is delusional, having difficulty sitting up, and may be at risk of convulsions or is having seizures, then nothing should be placed in the mouth and attempting to give fluids at such times could result in choking or flooding the lungs. Do not attempt to give juice or water to people experiencing such symptoms.

There have been anecdotal reports of naloxone being used during SCRA-related episodes and reputedly ending the episode. This has variously been attributed to potential action of SCRAs at opiate receptors, SCRAs cut with opiates (for which there is no evidence), dual use of opiates and SCRAs (where the naloxone is blocking the opiate action not the SCRA), or some other mechanism yet unknown.

Where there is reasonable belief or grounds to think the casualty is experiencing an opiate overdose then naloxone should be deployed if available.

In other situations where there is a non-responsive casualty with critically-reduced respiration, Emergency Services should of course be called. First Aid interventions including rescue breaths and CPR may be required, and advice from emergency call handlers can be sought, including whether to deploy naloxone.

Passive Exposure: Anecdotal reports from prison and housing settings suggest that passive exposure to second-hand SCRA fumes can have unpleasant effects. This has included:
- Custodial staff intentionally having smoke blown in the face,
- First responders entering rooms or cells to deal with casualties
- Custodial and housing workers affected by smoke on poorly ventilated wings or corridors.

It is unclear if the symptoms are a direct result of the intoxicating effects of SCRAs or if there is a psychosomatic effect triggered by poor ventilation, heat, anxiety and the smell of Spice.

@nticopyright: share with full acknowledgement

There is no forensic literature available to confirm that those passively exposed to SCRAs test positive for the drugs.

The most commonly-reported symptoms post exposure include headaches, dizziness, nausea, altered heart rate and feelings of anxiety. The reported symptoms invariably self-resolve after a few hours.

To reduce the risks associated with passive exposure:

- Exercise caution when entering rooms or confined spaces where SCRAs have been used; let colleagues know where you are going and, where appropriate, attend with a second person;
- Avoid entering contaminated environments if at increased risk due to (for example) pregnancy, heart related problems;
- Where possible maximise room ventilation through opening windows and doors;
- do not spend prolonged periods of time in contaminated space where avoidable;
- consider washing clothes if they smell of Spice. (This is not because it may be toxic, but rather that the smell appears to be enough to make some people feel unwell);
- if you feel affected following exposure, let colleagues know; find a quiet space to sit or lie down. Take on fluids, for example sweetened tea.
- Do not attempt to drive if feeling affected.

Testing/detection: Urine immune-assay tests were developed for first generation SCRAs but became obsolete rapidly when the products on the market changed. Testing companies were understandably hesitant about developing tests for second generation compounds fearing that any such tests would also become redundant.

Tests for third generation SCRAs are available and were able to detect many of the SCRAs on the market around 2014-15. However they weren't able to detect all SCRAs. In one piece of research conducted in prisons, "dip and read" tests of over 500 samples showed positive results 1.7% of the time. The same samples subjects to LC/MS analysis in a laboratory revealed 20.2% of samples were positive for SCRAs, highlighting the poor sensitivity of urine testing.

As new compounds have emerged since this research, it is likely that older tests will be still less accurate with emergent SCRAs.

Some prisons have been using ion-track machines to test letters and swab prisoners. These can detect some older synthetic cannabinoids but again may not be up-to-date with emergent compounds. Several prisons have been perplexed at finding no drugs showing up on the ion-track but getting positive results for acetone. This led to the erroneous belief that prisoners were simply using acetone to "get high."

It is more likely that the machines were able to detect and match acetone to the database and showed positive results for this but couldn't do the same for the novel SCRAs presenting the false impression that there was just acetone present.

@nticopyright: share with full acknowledgement

Acetone is highly volatile, and so paper soaked in acetone will dry out rapidly leaving only traces of acetone behind. There would be no intoxicating effects of smoking paper with traces of acetone on it.

Folk Devils and Moral Panics: The Psychoactive Substance Act removed legitimate synthetic cannabinoids from the Head Shop shelves, and in doing so eradicated the labelled, regulated trade. This reduced access to young people and recreational users. Overall the demand and use for synthetic cannabinoids is very low. Of the 20,000 plus entries for cannabis products on one Dark-Web drug market, less than 300 are for SCRAs. Given the choice most people prefer traditional cannabis. Spice and Mamba have become the preserve, almost exclusively or homeless and incarcerated users. For the suppliers there is enough demand and profit in these small markets to warrant importing and distributing the drug. For the users, the oblivion provided by SCRAs is worth it, in lieu of other drugs, to escape the unpleasant environment of street homelessness or prison.

The use of Spice in community settings is inextricably linked to homelessness. There has been a well-documented correlation between homelessness and drug use and as the former has increased in the UK over the past few years, so too has the level of drug use amongst people in housing need. And one of the affordable, available drugs in some areas remains Spice. In previous generations this cohort would have been more likely to develop opiate habits. In some cities this time, SCRAs have become the go-to drug instead. It has the advantages of low cost, high availability and no need to inject it. In some cities where spice is less available, workers and housing providers have seen a reversion to heroin use amongst street homeless populations.

The highly-visible phenomenon of people intoxicated with SCRAs in public places has led to a massive level of pejorative media coverage. References to “spice” as a “zombie drug” and pictures of people paralysed and apparently insensible in the street have created a sense of a spice epidemic out of control.

In turn this reporting has reinforced the sense that synthetic cannabinoids are something that we don’t understand, can’t respond to and can’t manage. In the same way that crack users in the early 90s were demonised and excluded from housing and other services, so now spice users are the new untouchables.

The lack of resources, combined with the social stigma associated with spice use contribute in turn to poor self-esteem, lack of self-worth and make engagement with services still more difficult.

Services are starting, slowly, to develop holistic responses for people with multiple needs who use synthetic cannabinoids.

@nticopyright: share with full acknowledgement

FURTHER INFORMATION:

Spice Boys: In 'Spice Boys', VICE reporter Ben Ferguson travels to Manchester to meet some users who have become addicted to over-the-counter substances. [made pre-PSA but highlights addictive nature of SCRAs] https://www.vice.com/en_uk/article/3bjka3/spice-boys

Drugs Map of Britain: Wolverhampton: getting off Mamba [2016]**:** In the first of our landmark new series looking at drug use across Britain, we explore a legal high epidemic in Wolverhampton. Following 27-year-old Liam over three months in his battle to quit the synthetic cannabinoid black mamba.
https://www.bbc.co.uk/iplayer/episode/b07tlxt4/drugs-map-of-britain-1-wolverhampton-getting-off-mamba

Spice: Synthetic Cannabinoids (SCRAs) [2017]: Linnell Publications/Manchester City Council/NHS Manchester CCG
http://michaellinnell.org.uk/resources/downloads/Spice_info_sheetv1.3_interactive.pdf

Harms of Synthetic Cannabinoid Receptor Agonists (SCRAs) and Their Management: Neptune: 2016 http://neptune-clinical-guidance.co.uk/wp-content/uploads/2016/07/Synthetic-Cannabinoid-Receptor-Agonists.pdf

Spice: The Bird Killer: User voice: 2016 http://www.uservoice.org/wp-content/uploads/2016/05/User-Voice-Spice-The-Bird-Killer-Report-Low-Res.pdf

North West 'Through the Gate Substance Misuse Services' Drug Testing Project – further public health monitoring study – North West Final Report 2017
"The main objectives of the study were to determine drug misuse patterns for public health monitoring purposes and to inform healthcare commissioning intentions. The study also provided an opportunity to review the effectiveness of the 'Spice' point of care immunoassay screening test that was at the time being widely used across the prison estate to test for the use of synthetic cannabinoid receptor agonists (SCRAs)."
https://www.lgcgroup.com/services/drug-and-alcohol-testing-in-the-workplace/odtcase-study/#.XDMbpc3gouU

Spice Users are Becoming a Cruel Online Joke: A growing number of sites have become dedicated to posting 'funny' videos of the victims of Britain's Spice epidemic.
https://www.vice.com/en_uk/article/9kvy7y/spice-users-are-becoming-a-cruel-online-joke

Sources and acknowledgement: The contributions from numerous training participants in community and custodial settings including those with lived experience of Spice user contributed massively to the development of this resource. The briefing draws on information from numerous other sources including DrugsForum, Bluelight, Wikipedia, Erowid, Home Office, EMCDDA and other sources. Discussions and information shared on the DrugWatch discussion group were invaluable in preparation of this document.

 @nticopyright: share with full acknowledgement