Literature Review: PAVA & Children

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Purpose

Requested by YCS ELT, this document includes a review of the evidence regarding the use of the Pelargonic Acid Vanilylamide (PAVA) incapacitant spray with children under the age of 18, in particular:

- Where is PAVA used with children, internationally.
- Is there any learning from the above.
- Has there been any impact on safety.
- Has there been any impact on staff child relations.

Method

To conduct this review, all available literature was considered regarding the use of PAVA including that specifically related children and which is referenced throughout. The search included published and unpublished articles although few appeared available in the public domain. Some internal documents were shared for internal use only. This lack of available evidence might indicate PAVA is infrequently used with children and where it is used, evaluation is limited or if completed, not made widely available.

Background

HMPPS have a duty to ensure the safety of all children, staff and visitors across all types of estates; Adult Male, Adult Women's and Youth Custody (male and female). With levels of violence amongst all populations consistently and concernedly high[1], various policies and procedures are authorised for use to minimise the associated risks and increase environmental stability. One such measure within the Adult Male estate is the use of the PAVA incapacitant spray[2]. Within YCS, this is only authorised for use with children by the NTRG under the authority of the Gold Commander. That is, there is no site which accommodates children in custody where staff are authorised to use PAVA.

Regulated by the Firearms Act 1968, incapacitant sprays are prohibited weapons which only various parties such as the Police and HMMPS have the authority to use. Aerosolised incapacitants are used to gain compliance and minimise a person's ability to resist.[3] One such incapacitant is PAVA which is a synthetic version of Oleoresin Capsicum (OC), also known as pepper spray[4]. More commonly used than OC in the UK due to easier targeting when sprayed, PAVA is dispensed from a handheld canister, to

[1] HM Inspectorate of Prisons (2018). *HM Chief Inspector of Prisons for England and Wales Annual Report 2017-18.* London: Her Majesty's Inspectorate of Prisons.

[2] Ministry of Justice (2018). *Introducing the use of PAVA spray in prisons.* Accessed from: Introducing the use of PAVA spray in prisons - Working in the Prison and Probation Service (blog.gov.uk)

[3] His Majesty's Inspectorate of Constabulary and Fire & Rescue Services. *Incapacitant spray.* Accessed from: Incapacitant spray - His Majesty's Inspectorate of Constabulary and Fire & Rescue Services (HMICFRS) – Home (justiceinspectorates.gov.uk)

[4] Home Office (2014). *Comparison report on CS and PAVA Sprays.* Centre for Applied Science and Technology (CAST).

cause tears and severe pain and closure to the eyes[5]. Due to higher levels of accuracy and lower flammability**Error! Bookmark not defined.**, PAVA is generally preferred over the CS (2-chrobenzylidene malononitrile) incapacitant. In terms of effects, both CS and PAVA cause pain in the eyes**Error! Bookmark not defined.** but CS also causes burning sensations in the nose and throat**Error! Bookmark not defined.**. Whilst various incapacitant sprays are therefore available, PAVA is approved for use within HMPPS to gain compliance under certain circumstances. However, this level of authority for use by site staff does not currently extend into either the women's or children's estates.

PAVA in the Adult Estate

HMPPS introduced PAVA in 2017 in some adult male establishments to assist Officers in maintaining control, safety and stability in difficult refractory situations. Evaluation of the pilot concluded PAVA was safe to use as one element of a wider safety strategy with recommendations made to reduce the associated risks**Error! Bookmark not defined.**. Such governance includes all unified staff being trained in the Five Minute Intervention (FMI) and being issued with Body Worn Video Cameras (BWVC). Such measures aim to ensure PAVA is only used as a measure for last resort and then, only if still necessary. Following the pilot, PAVA was further rolled out across other adult male sites between 2019 and 2020. Whilst it continues to not be authorised for use with either children or females in custody, with violence particularly high in the children's estate[6] due to a combination of this cohort's complex needs and the custodial environment, such behaviour presents risks of serious harm to children, staff and visitors across YCS[7]. The question has therefore arisen as to whether PAVA would be a suitable action to take to reduce the associated risks of harm to those involved.

General Effects of PAVA

PAVA works by irritating mucous membranes in the eyes, nose mouth and lungs to such an extent that the recipient is incapacitated via crying, sneezing, coughing, difficulty breathing, pain in the eyes and temporary blindness. Whilst research appears limited, exposure to incapacitant sprays may produce numerous short-term and long-term health effects[8]. Of the research available, concerns have been highlighted regarding people with pre-existing respiratory conditions such as asthma[9]. Frequent or high levels of

[5] Association of Chief Police Officers of England, Wales and Northern Ireland (2009). *Guidance of the Use of Incapacitant Spray.*

[6] Brooks, S., Johnson, P., Clarke. S., & Morton, L. (2019). *Youth Custody Service Safeguarding Review.*

[7] HM Inspectorate of Prisons (2018). *HM Chief Inspector of Prisons for England and Wales Annual Report 2017-18.* London: Her Majesty's Inspectorate of Prisons.

[8] Rothenberg, C., Achanta, S., Svendsen, E. R., & Jordt, S. E. (2016). Tear gas: an epidemiological and mechanistic reassessment. *Annals of the New York Academy of Sciences*, *1378*(1), 96-107.

[9] Schep, L. J., Slaughter, R. J., & McBride, D. I. (2015). Riot control agents: the tear gases CN, CS and OC—a medical review. *BMJ Military Health*, *161*(2), 94-99.

exposure also appears associated with an increased risk of respiratory illnesess[8]. Skin exposure to such sprays may also cause chemical burns or induce allergic contact dermatitis[9]. Severe exposure or exposed at a close range might result in scaring of the cornea, potentially resulting in permanent loss in visual acuity[10]. Injuries have also been reported from being hit by incapacitant spray cartridges[11].

Children's Legislation & PAVA

In accordance with the Children's Act, any person under the age of 18 years is legally a child and should be safeguarded accordingly to enable and promote healthy development into adulthood. As such, YCS has both a moral and legal duty to safeguard all children in their care including taking action to prevent harm. Where this responsibility is not upheld, inflicting harm, or failing to act to prevent harm, may legally constitute abuse and/or neglect and in more serious cases under the United Nations Convention on the Rights of the Child (UNCRC), torture. As a result, careful consideration is given to the design and application of services for children in custody including those which aim to inflict physical harm for the purpose of safety and control such as pain-inducing physical holds, softer cuffs, batons and PAVA[13]. Whilst batons are not used with children due to physical development needs, the challenge is to balance both legal and moral duties i.e. to keep staff, children and visitors safe and maintain stability whilst also meeting the safeguarding responsibilities towards a population of exceptionally complex children.

PAVA as a Pain-Inflicting Technique

The use of physical force by staff with those in custody is permitted for health and safety reasons within strict parameters. As a child-specific approach, YCS uses the Minimising and Managing Physical Restraint (MMPR) which, in comparison to the adult Control and Restraint (C&R) procedures, includes a greater focus on relational security and de-escalation techniques. MMPR also avoids pain-inducing techniques in recognition of the developing child and with physical restraint being deemed traumatising or re-traumatising for any recipient[12]. Indeed, it was recommended custody should "ban the use of any technique designed to inflict pain on children"[13]. Given that the aim of incapacitant sprays is to induce discomfort and pain, consideration should therefore be given to any potential conflict with MMPR and the associated aims.

[10] Oksala, A., & Salminen, L. (1975). Eye Injuries Caused by Tear-gas Hand Weapons. *Acta Ophthalmologica*, *53*(6), 908-913.

[11] Wani, M. L., Lone, G. N., Singh, S., Dar, A. M., Bhat, M. A., Ashraf, H. Z., & Irshad, I. (2011). Vascular injuries caused by tear gas shells: surgical challenge and outcome. *Iranian journal of medical sciences*, *36*(1), 14-17.

[12] Spinzy, Y., Maree, S., Segec, A., & Cohen-Rappaport, G. (2018). Listening to the Patient Perspective: Psychiatric Inpatients' Attitudes Towards Physical Restraint. PsychiatrQ, 89, 691-696.

[13] Taylor, C. (2020). *A review of the use of pain-inducing techniques in the youth secure estate.* Accessed from: Review of pain-inducing techniques in the youth secure estate (publishing.service.gov.uk)

Children in Custody

The current population of children in custody present with exceptionally complex needs, including developmental difficulties associated with complex trauma[18]. With a history of chaotic childhoods, all children in custody are assumed to have experienced trauma. Regarding recorded Adverse Childhood Experiences (ACE), current evidence indicates over 50% of children in custody having, at least, five or more ACEs. With the impact of trauma being accumulative, any additional actions taken must therefore consider the potential impact. Conversely, given custody for children is a measure of last resort and is therefore reserved for the more serious, often violent, offences. In combination with complex trauma, such needs often manifest as difficult and challenging behaviour in custody including frequent displays of violence and aggression towards self and others. Whilst such behaviour could be deemed to be the frustrated 'voice of the child', such behaviour also presents as a risk to the stability of the estate and the safety of all staff, children and visitors. It is therefore accepted, under certain circumstances, proportionate use of physical force to maintain stability and therefore safety might be inevitable, especially given the specific needs of the population including age and stage of adolescent development[13].

Where is PAVA used with Children?

At present, the British Police are able to use incapacitant sprays with those under 18 in accordance with local use of force policies. In custody, the Gold Commander can also authorise use of PAVA by the NTRG. However, no evaluation could be found and it is therefore difficult to ascertain the differences between using incapacitant sprays with children and adults in the UK. Whilst PAVA is approved for use with children within various agencies across the world, limited evidence was available.

Of that available, in the USA, the use of incapacitant sprays has been approved across several secure facilities for children[14]. However, very few states appear to have authorised the use across law enforcement agencies. Indeed, in 2011 only 12% of secure facilities for children were reported to have authorised the use of incapacitant sprays[14] with many appearing to eventually ban the practice [14] e.g. Los Angeles phased elimination of incapacitant sprays completed in 2020[15].

What is the physical impact of PAVA with children?

Regarding the physical impacts of PAVA on children, health advice should be consulted before conclusions drawn. Whilst no evidence appeared available regarding whether

[14] US Department of Justice (2011). *Pepper Spray in Juvenile Facilities.* Council of Juvenile Correctional Administrators.

[15] Center for Children's Law and Policy (2019). *Chemical Agents in Juvenile Facilities.* Accessed from: Bureau of Justice Statistics, Special Report: (cclp.org)

there is a different physical impact in comparison to adults, concerns have been raised that PAVA might disproportionately impact on children especially those with pre-existing physical vulnerabilities such as asthma[16]. As highlighted by Taylor, children are particularly vulnerable to pain inducing techniques due to the physical stage of development. Whilst not PAVA specifically, research conducted on the use of incapacitant sprays with this cohort have raised significant concerns[17]. Children have lower pain thresholds in comparison to adults[17] and will therefore feel greater physical pain from the PAVA. Research exploring the use of incapacitant sprays on an 11-year-old child highlighted physical health implications[17]. Burning and swelling of the eyelids, streaming eye and uncontrollable blinking were present for up to an hour after the spray being used[17].

Emotional & Psychological Impact

In comparison to children in general, those in custody have greater mental health, needs[18] and research has highlighted concerns regarding the use of incapacitant sprays with individuals with such needs[19]. In particular, using sprays with complex needs can increase and exacerbate difficulties deescalating situations[19]. Whilst PAVA aims to control behaviour, exposure to incapacitant sprays may normalise pain[28]. Given the negative impact on emotional management[20], pain is therefore associated with higher levels of aggression. The use of incapacitant sprays therefore has the potential to escalate, rather than de-escalate[21], incidents.

Regarding psychological impact, research regarding the use of incapacitant spray on an 11 year old child highlighted psychological impacts with the child presented as agitated, restless and disorientated for up to 10 minutes after the spray being used[17] which may have escalated, rather than de-escalated, the situation. Peer influence should also be considered[22] with a potential risk of PAVA being used against them becoming a “badge

[16] Broadstock, M. (2002). *What is the Safety of" pepper Spray" Use by Law Enforcement Or Mental Health Service Staff?*. New Zealand Health Technology Assessment, Department of Public Health and General Practice, Christchurch School of Medicine.

[17] Stefanova, K. (2014). Special Features in the Treatment after Pepper Spray KO jet Exposure in Childhood (clinical case) In C. DIshovsky and J. Radenkova (Eds), *Toxicological Problems* (pp. 189-193). Military Publishing House.

[18] Taylor, J., Shostak, L., Rogers, A., & Mitchell, P. (2018). Rethinking mental health provision in the secure estate for children and young people: a framework for integrated care (SECURE STAIRS). *Safer Communities.*

[19] Greinsky, C. M., Holland, S., & Martin, J. (2000). Report of the Pepper Spray Committee Civilian Complaint Review Board. *Annotation*.

[20] Anderson C. A., Bushman, B. J. (2002). Human Aggression. *Annual Review of Psychology, 53*, 27 – 51.

[21] Anderson K.B, Anderson C.A., Dill K.E., Deuser W.E. (1998) The interactive relations between trait hostility, pain and aggressive thoughts, *Aggressive Behavior, 24*, 161-17

[22] Webb, L., Stegall, S., Mirabile, S., Zeman, J., Shields, A., & Perry-Parrish, C. (2016). The management and expression of pride: Age and gender effects across adolescence. *Journal of Adolescence*, *52*, 1-11.

of honour"[23]. Children might then start to behave in such a way that encourages staff to deploy PAVA.

Relational Impact

Children need adults and in recognition, YCS places great emphasis on developing and creating a culture which promotes positive relationships and attachments between staff and children. Whilst limited, literature regarding the use of PAVA makes reference to the potential negative impact on this cultural cohesion [14] and the potential fracturing of relationships between staff and children[24]. Further, levels of violence against staff by children are of serious concern. Whilst children in custody use weapons this tends to be against other children due to a perceived or actual threat i.e. self-defence[25]. Whilst assaults against staff tend not to include the use of weapons, consideration should be given as to whether this trend might be impacted by staff carrying and potentially using PAVA, a weapon. Children may become fearful of PAVA being used against them and subsequently retaliate with using weapons against staff.

An evaluation of the use of incapacitant sprays by the British Police highlighted further concerns[26]. This included damaging relationships between police and members of the community, a concern which has also been raised within other studies across other settings[26]. Additionally, it has been proposed that being in possession of incapacitant sprays does not act as a deterrent to assaulting police[26]. Reports have also included police misuse of incapacitant sprays, despite clear policies and procedures[26].

Neurobiological/Neurocognitive Development

As children transition from adolescence into early adulthood, development processes can impact on behaviour and therefore need consideration when making decisions regarding the implementation of PAVA. For instance, the relationship between brain development and risk taking/impulsive behaviour[27] and children in custody have implications for how they might respond to PAVA such as attempting to grab the dispenser from staff. A disproportionate amount of children in custody are neurodiverse and require longer to understand and process instructions. Whilst PAVA might be implemented within a package of other protective policies as seen in the adult estate, given the impromptu application, it is reasonable to conclude the staff involved may not

[23] Curcio, A. L., Knott, V. E., & Mak, A. S. (2015). Why do young people engage in delinquency and problem drinking? Views from adolescents and stakeholders. *Australian Psychologist*, *50*(5), 350-361.

[24] Justice, F., & Better, F. C. (2013). A Roadmap for Change.

[25] Maslow A.H. (1954) *Motivation and Personality.* Harper and Row.euro

[26] Tyler, L., & King, L. (2000). Arming a traditionally disarmed police: an examination of police use of CS gas in the UK. *Policing: An International Journal of Police Strategies & Management*, *23*(3), 390-400.

[27] Romer, D. (2010). Adolescent risk taking, impulsivity, and brain development: Implications for prevention. *Developmental Psychobiology: The Journal of the International Society for Developmental Psychobiology*, *52*(3), 263-276.

have an individualised understanding of the child or it could too soon with children with cognitive processing issues.

Impact on Environmental Culture Factors

The use of PAVA with children in custody presents a dilemma between the need to ensure safety[14] and the overarching aims of a nurturing trauma informed environment for children[18]. Indeed, many states with USA have decommissioned the use of PAVA concluding “chemical agents have no place in juvenile facilities”. Indeed, evidence from USA indicated that states which authorised incapacitant sprays with children tended to be more punitive and adult-focused than those which did not approve[14].

The ultimate aim of YCS is to improve outcomes for children in its care in custody. One way in which this is achieved is via a multiagency framework of trauma informed practice. Not only could the implementation of PAVA therefore potentially contribute to the accumulation of trauma in this population but could also therefore potentially undermine the integrity of YCS approach. Indeed, evidence indicates the use of such incapacitant sprays contribute to a culture of fear[28], rather than one of reparation and positive direction.

The majority of research regarding PAVA does relate to police use in which this is usually deployed in open air settings[9] and concerns were highlighted within closed environments such as custody in the HMPPS pilot evaluation**Error! Bookmark not defined.**. An additional consideration when using PAVA within closed environments relates to how to alleviate pain in the eyes with the most effective method being fresh air. Given that allowing access to fresh air with children in custody may be an issue and using water, which would be readily available, on eyes immediately after being sprayed increases physical symptoms, this may cause concern for using PAVA in YCS. Another secondary impact involves the side effect from the aroma settling on others in close proximity to the intended child which may be an issue given the amount of group violence demonstrated amongst this population. Additionally, it is also possible this may also contaminate staff given the amount required to manage such incidents.

Race & Ethnicity

Almost 50% of children in custody are from ethnic minority backgrounds and therefore overrepresented. Also over-represented within YCS is the use of physical force with this population of children and this disproportionate application of policy was also detected in the PAVA evaluation. For some establishments, black heritage men were impacted by 11-15% of PAVA incidents despite only accounting for 2-7% of the population**Error! Bookmark not defined.**. A recent HMIP Thematic Review regarding the experiences of

[28] Dawson, P. (2018) *PAVA Spray: A Prison Reform Trust Position Paper, London: Prison Reform Trust*. Available at: http://www.prisonreformtrust.org.uk/Portals/0/Documents/PAVA%20PRT%20position%20paper.pdf

black men in custody and also black prison staff[29]. The former reported that staff viewed them as a group rather than as individuals and poor relationships appeared to culminate in a disproportionate use of force. The perception of black men in custody was that PAVA and batons were not used as a last resort, which is a breach of policy. Given the recency of this evidence, it might therefore be presumed that if implemented, PAVA will likely be disproportionately used against black children in custody.

Gender

Evidence indicates the impact and side effects of PAVA can be different between genders with incapacitant sprays associated with menstrual changes**Error! Bookmark not defined.**. PAVA is not currently approved to be used in either the Women's or Children's HMPPS estates. In comparison to boys, only a few girls are accommodated in YCS. Whilst most are in the Secure Childrens Homes, since July 2021, girls have been accommodated in a YOI alongside boys. Whilst out of scope of this current decision, consideration would therefore potentially be needed either regarding the implementation of PAVA with females in custody or the potential implications on staff having PAVA where girls are potentially accommodated.

[29] HM Inspectorate of Prisons (2022). *The experiences of adult black male prisoners and black prison staff: Thematic Review.* London: Her Majesty's Inspectorate of Prisons.