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Animal-assisted intervention services across UK intensive care units: A national service evaluation

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Abstract

Background: Animal-assisted interventions (AAI) can provide psychological support to critical care patients during their intensive care unit (ICU) admission. However, there are currently no data on AAI services across UK ICUs. The current study therefore aims to (i) determine how many ICUs in the UK offer services, (ii) characterise available services and (iii) explore and review local documentation for service oversight.

Methods: A service evaluation comprising two parts; a national survey of UK ICU's, analysed using descriptive statistics, and review of local service oversight documents, analysed using a framework approach.

Results: Responses from 74 sites (1242, 30.6%) were included in survey analysis. AAI services were present at 32 sites (174, 43.2%), of which 30 offered animal-assisted activity services alone and 2 offered both animal-assisted activity and animal-assisted therapy services. Animal-assisted activity services were typically delivered on a weekly basis, lasting 30–60 min and with dogs the sole animal employed. Concern over infection prevention and control was the most common barrier to service provision, as well as a lack of supporting evidence. Sixteen sites provided 27 oversight documents for analysis, that highlighted unique and shared responsibilities between critical care staff and animal therapy handlers, including aspects of administration, welfare and infection control.

Conclusion: From a small sample, AAI services were available in less than half of ICUs. Empirical value of interventions is countered by current lack of definitive evidence of effectiveness, which should be addressed before wider implementation of AAI services and the associated resource requirements, is undertaken.

Keywords

Intensive care, critical illness, animal-assisted activities, animal-assisted therapy, animal-assisted intervention, service evaluation

Introduction

Critically ill patients in the intensive care unit (ICU) can experience varied psychological sequelae including, but not limited to, anxiety, depression, post-traumatic stress disorder and loneliness.^{1,2} In recent years, animal-assisted interventions (AAI) - the involvement of trained therapy animals under the supervision of staff and volunteers – have been employed to provide psychological support to patients during their ICU admission, an example of a non-pharmacologic intervention to enhance humanisation and holistic care.³ Under the overarching AAI term, distinction is made between *animal-assisted activity* (AAA) where a volunteer handler brings a trained animal to the patient for general interaction (e.g. 'meet and greet' style episodes of therapeutic, motivational, or educational benefit), and *animal-assisted therapy* (AAT) involving use of a trained animal by healthcare professionals to address individualised patient requirements with subsequent measurable goal-directed activities that are documented and evaluated.^{4,5}

The novelty of AAI in the critical care setting is reflected in a recent scoping review; only six studies were identified, all of a feasibility or observational design and with five published since 2019.⁶ Notably, only one of these studies was from the UK and focused on the paediatric intensive care setting and population.⁷ All other

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studies included in this scoping review were conducted in North America,^{8–12} of which only two were exclusive to the ICU setting^{8,12} and the remainder were a combination of ICU and other acute or ward settings. Studies demonstrated significant variability in AAI intervention, but were typically meet-and-greet interactions.⁶ Summary descriptive synthesis of findings from all studies indicated that outcomes including pain,¹¹ and anxiety and stress,^{8,11} were all reduced in patients. Clinician factors including morale and stress were positively impacted, both through direct survey assessment of staff and qualitative observations from therapy animal handlers.⁹ Very high levels of support for continuing or expanding AAI services was also identified.^{7,9,11,12} The prevalence of anecdotal evidence in this scoping review underpinned the main conclusion that further research was required to determine effectiveness of AAI interventions, their acceptability for patients, family members and clinicians, and potential impact for the wider management of patients.⁶ One further study published just after this scoping review, found that in a small single group located in acute care, an animal-assisted therapy programme reduced anxiety, heart rate and respiratory rate, and improved subjective measures of comfort and wellbeing.¹³ A further, more recent study showed positive safety, acceptability, and clinical outcomes, also adopted an observational design and again focused on paediatric critically ill patients.¹⁴ Nonetheless, national guidance from organisations such as the Intensive Care Society¹⁵ and Royal College of Nursing – highlights the importance of implementing AAI services across adult UK ICUs. However, there are currently no data on provision of AAI services across UK ICUs for adult critically ill patients. Therefore, the aim of this study was to conduct a national service evaluation of current AAI services across UK ICUs, to (i) determine how many ICUs in the UK offer services, (ii) characterise available services including, for example type, format, extent, personnel involved and (iii) explore and review local documentation for oversight of available services.

Methods

Design

This study is a service evaluation comprising two parts^{16,17}; a national survey of UK ICUs, and a review of local service oversight documents. It is reported in keeping with the Checklist for Reporting Results of Internet E-Surveys.¹⁸

Sample

The sample frame for the service evaluation was all hospitals with adult NHS ICUs across the UK (England, Scotland, Wales and Northern Ireland). These were identified via the Intensive Care National Audit and Research Centre (ICNARC) Case Mix Programme, <https://www.icnarc.org/Our-Audit/Audits/Cmp/About/Participation>) and the Scottish Intensive Care Society Audit Group

(<https://www.sicsag.scot.nhs.uk/index.html>). Individual ICUs were reduced to generate a denominator of unique hospitals (n=242).

Development of national survey

A predominantly closed-question, online survey was designed in Microsoft Forms with questions generated from experience and expertise of the research team as well as informed by available evidence related to AAI in critical care (see Supplemental File 1). Survey questions were sequentially ordered with single or multiple response options, and inclusion of free-text options for further detail where applicable. Filtering functionality ensured respondents were presented with appropriately ordered questions based on preceding responses. Pilot testing, to ensure content, construct, and face validity, and sensibility, was undertaken internally within the research team, and externally by a group of multiprofessional critical care clinicians with interest and knowledge of the topic; this ensured (i) comprehension and interpretation of questions, (ii), flow, salience, acceptability, and ease of completion, (iii) missing items of response options and (iv) time required to complete.¹⁹ This process mirrors previous surveys conducted in the same sample.²⁰ Survey questions were then refined and finalised. Survey domains included demographics of AAI services, detail of service delivery and supporting oversight documentation.

Survey dissemination

An invitation email containing the link to the online survey and accompanying Participant Information Sheet was circulated via (1) the Intensive Care Society membership, (2) national and regional critical care networks and (3) social media, to achieve a snowballing approach to dissemination. The survey was open for a period of 8 weeks (February–April 2024), with repeated circulation and targeted approaches to maximise response during the interim timeframe.

Review of local service oversight documents

Survey respondents who indicated that they delivered AAI services in their ICU were additionally asked what local oversight documents were in place (e.g. a policy, protocol, guideline, or other similar document) to support service delivery, and to send a copy of these documents to the research team. A reminder email was sent if no response was received after 2 weeks.

Data analysis

Survey data were downloaded from the survey platform into Microsoft Excel (Microsoft Corp, Redmond, WA, USA). Multiple responses for any individual hospital site were de-duplicated and amalgamated into single response sets. Where discrepancies were identified between response sets, the most complete and/or first-received response set was used as the final response option.²⁰ Respondents providing

contact details were contacted to confirm or clarify any queries with regards responses. Descriptive statistics were used to analyse quantitative responses including normality testing, mean (SD) or median (IQR) scores, frequencies, proportions. Summative content analysis was used to analyse any free text comments.²¹ Analyses were performed using Microsoft Excel.

Oversight documents were analysed by two researchers (SW, cross-checked by BC) using a framework analysis approach broadly adopting the following stages^{22–24}:

- (i) *Familiarisation*: This involved organising the number and type of documents received from sites according to categories defined by survey question response options. This served as a foundational step in gaining content familiarity.
- (ii) *Developing a framework*: Themes and topics, based on key aspects of content reported in documents and generated through familiarisation, were used to generate initial frameworks
- (iii) *Coding/indexing*: Systematic application of codes from the agreed analytical framework to the whole dataset.
- (iv) *Charting the data*: entering summarised data into the framework matrix.
- (v) *Mapping and interpretation with any coding refinements*: Interpretation of findings, mapping similarities and differences across the data, exploration of patterns or explanatory themes.

Ethical considerations

The study was approved by Queen's University Belfast Medicine, Health, and Life Sciences REC (MHLS 23_155). Participation in the service evaluation was voluntary and participants could withdraw at any time up until the point of submitting their responses. A Participant Information Sheet was available, and the opening introduction page of the survey also included all relevant information regarding participation. Participants were asked to confirm reading of several consent statements, and survey completion was considered indicative of informed consent. Surveys were completed anonymously, unless indicating availability of an AAI service and agreement to provide any local oversight document; in which case, these participants were asked to provide email address for the purposes of follow-up contact. Further provision of contact details was voluntary. All service evaluation data, including participant email addresses, were held in secure, password-protected institutional servers, only accessible by members of the research team from that institution (Queen's University Belfast).

Results

Survey response rate and availability of AAI services

In total, 88 site responses were received (/242, 36.4%), of which 14 were identified as duplicates and removed from

the dataset resulting in a total of 74 responses included in analysis (/242, 30.6%). Across the UK, the breakdown of survey response was as follows: England ($n=59/195$, 30.3%), Scotland ($n=7/23$, 30.4%), Northern Ireland ($n=5/9$, 55.6%), and Wales ($n=3/15$, 20%). Thirty-two sites (/74, 43.2%) reported that they currently have AAI services available for critically ill patients, including 31 based in England and 1 based in Wales. Most services commenced in the last 5 years ($n=19$, 2019 onwards), 5 were uncertain with regards start date, and the remainder ($n=8$) commenced > 5 years ago. Of the sites with services available, these were AAA services alone for nearly all (30/32, 93.8%), and with two sites (6.3%) reporting both AAA and AAT services available. No site had AAT services alone.

Animal-assisted activity services

Just over half of sites with AAA services (18/32, 56.3%) reported having a designated coordinator/champion who identified patients and arranged visits. Similarly, most sites (19/32, 59.4%) also reported that services were available to all patients, but infection management and/or immunocompromise was the main reason for patient exclusion. All services involved dogs, with the most common breeds including golden retriever, cockapoo and labrador; no other animals were reported. Sessions typically lasted 30–60 min (14/32, 43.8%), on a weekly basis (11/32, 32.4%), with 1 handler present (29/32, 90.6%). Handlers were external/independent volunteers from registered animal organisations in most services (23/32, 71.9%). All sites reported that AAA sessions involved patients talking to/engaging with the animal, and thereafter the most common activity was participation in animal cares (13/32, 40.6%). Most sites (27/32, 84.4%) reported they did not collect any feedback from either patients or staff on their enjoyment and/or potential benefit from AAA session. No site reported any episode of patient harm during an animal visit; one site reported an episode of animal harm (consumption of prohibited food item). Further detail of characteristics of AAA services is reported in Table 1. Free text responses provided by sites with AAA services are outlined in Supplemental File 2 (Table E1).

Animal-assisted therapy services

Of the 2 sites that offered AAT services, 1 was based in England and the other was based in Wales. Both sites reported that AAT services were limited to critically ill patients without infection risk, allergies to dogs (the specific animal used by each) or located in particular clinical areas for example, long-term ventilation/complex care ICU. Therapy dog/handler pairs were external volunteers from a registered animal organisation. Patients were selected for therapy sessions for a variety of reasons – family/care partner request, referral by ICU staff member (including physiotherapy and psychology), or directly by the handler (where at one site, the handler was a staff member). Whilst each site varied in terms of typical

Table 1. Characteristics of animal-assisted activity services.

Characteristic	Options	n/32 (%)
Designated coordinator or champion	Yes	18 (56.3)
	No	14 (43.8)
Availability to all patients	Yes	19 (59.4)
	No	13 (40.6)
Length of visits	<i>Reasons for patient exclusion^a – Infection, n = 10; Immunocompromise, n = 6; Delirium/agitation, n = 4; Open wounds, n = 3; Fear/dislike of dogs, n = 2; Illness severity, n = 2; Post-operative cardiothoracic patients, n = 1</i>	
	Over 60 min	11 (34.4)
	30–60 min	14 (43.8)
	Less than 30 min	6 (18.8)
Frequency of visits	Other (variable to accommodate animal handler)	1 (3.1)
	Daily	0
	Weekly	11 (34.4)
	Fortnightly	7 (21.9)
	Monthly	8 (25)
Number of handlers per visit	Other (occasional, multiple/week, occasional)	6 (18.8)
	1	29 (90.6)
	2	3 (9.4)
	3 or 3+	0
Nature of volunteer/handler	External volunteer from a registered animal organisation	23 (71.9)
	HCP from within the ICU team	0
	HCP within the ICU team from an animal organisation	3 (9.4)
	HCP outside the ICU team	2 (6.3)
	HCP outside the ICU team from an animal organisation	2 (6.3)
	Combination of independent volunteer and HCP	1 (3.1)
Activities included in session ^b	Other (Internal volunteer)	1 (3.1)
	Patient talks to/engages with the animal	32 (100)
	Patient participates in animal cares	13 (40.6)
	Patient completes a rehabilitation activity	7 (21.9)
	Patient able to walk the animal	3 (9.4)
	Animal fetches	0
Feedback collected from patients	Other (Visits staff break room; distraction to calm anxiety during procedures; Dog sits on bed for strokes etc.)	2 (6.3)
	Yes (Examples include questionnaire, verbal)	5 (15.6)
Feedback collected from staff	No	27 (84.4)
	Yes (Examples include verbal, pictures, email, staff survey)	5 (15.6)
	No	27 (84.4)

HCP: healthcare professional; ICU: intensive care unit.

^aSummarised from verbatim details provided by respondents.

^bMultiple responses permitted therefore total exceeds denominator of 32.

length of therapy session (<30 min and 30–60 min), both sites reported that the number of sessions available to individual patients was at individual clinician discretion according to patient need. Healthcare professionals delivering therapy sessions were reported as nurses, physiotherapists and pharmacists. Both sites selected ‘all of the above’ in response to a multiple-choice question about the reasons patients received AAT; these reasons were low mood, anxiety, depression, pain and the need to improve interaction or engagement with different aspects of care (e.g. nursing, medical, rehabilitation). Subjective patient feedback was the only measure reported by either site for monitoring progress and/or evaluating outcomes. Neither site reported that they collected any feedback from patients or staff on the potential benefit of therapy sessions. No patients had ever been harmed during an AAT

session; one site reported an episode of animal harm (consumption of prohibited food item).

Oversight of AAI services

At the 32 sites with available AAI services, oversight approach was reported as follows: Self-drafted hospital/Trust policy/guidance/SOP (or equivalent document), 17 (53.1%); Adoption of independent professional organisation policy/guidance/SOP with local modifications, 8 (25.0%); and Adoption of independent professional organisation policy/guidance/SOP (or equivalent document), 2 (6.3%). The remaining 5 (15.6%) sites reported none of these options applied to them; two provided qualitative responses indicating delivery of services via local charity organisations (where those organisational policies would apply). As part of

Table 2. Summary of oversight documents provided for analysis.

Response ID	Number of documents	Document type/descriptor
<i>Self-drafted hospital/Trust policy/guidance/SOP (or equivalent document)</i>		
11	1	Trust SOP: <i>Pets as Therapy</i>
18	1	Trust SOP: <i>Dogs on Trust Premises</i>
33	1	Trust SOP: <i>Animal Assisted Intervention in Critical Care</i>
40	1	Trust Policy: <i>Animals and Pets in Hospital</i>
44	1	Trust Policy: <i>Animals and Pets in Hospital & Intermediate Care Unit</i>
54	1	Trust Policy: <i>Pets as Therapy</i>
56	1	Trust Policy: <i>Assistance Dogs and Pets as Therapy Dogs</i>
79	1	Trust Policy: <i>Pets for Therapy</i>
86	5	Trust Policy: <i>Animals Within Healthcare Settings</i> Trust Document: <i>Therapy Animal Visit Patient Register</i> Trust Document: <i>Pet visiting (Pet Therapy dogs) – visitor information</i> Trust Document: <i>Pet visiting (patient's own pets) – visitor information</i> Professional Organisation Guideline: <i>Risk assessment form for Pets as Therapy visits (Pets As Therapy)</i>
<i>Adoption of independent professional organisation policy/guidance/SOP with local modifications</i>		
13	1	Trust SOP: <i>Pets as Therapy</i>
37	2	Professional Organisation Guideline: <i>Infection Control and Risk Management (2008; Pets As Therapy)</i> Trust document: <i>Template for Pet Dogs Visiting Health Care Settings Request</i>
57	2	Trust SOP: <i>Animal Assisted Intervention within Adult Critical Care Services</i> Trust document: <i>Infection prevention and visit conduct checklist, and patient feedback questionnaire</i>
62	1	Trust Guidelines: <i>Animal Assisted Interventions in the ICU</i>
65, 66 ^a	4	Trust SOP: <i>Animal Assisted Intervention on Critical Care Units</i> Trust SOP: <i>Pet passport for the safe visiting of pets in the hospital setting when a patient is critically unwell in the Adult Critical Care Unit</i> Trust Document: <i>Therapy Dog Visiting register</i> Trust Document: <i>Pet passport</i>
98	1	Trust SOP: <i>Pets as Therapy Within ICU for Staff and Patient Wellbeing</i>
<i>Adoption of independent professional organisation policy/guidance/SOP (or equivalent)</i>		
51 ^b	3	Professional Organisation Guidance: <i>Animal Assisted Intervention in a critical care setting (Intensive Care Society)</i> Clinical Professional Resource: <i>Working with Dogs in Health Care Settings (Royal College of Nursing)</i> Trust Policy: <i>Policy and procedure for the management of animals</i>

SOP: Standard Operating Procedure; ICU: intensive care unit.

^aFour documents were submitted to represent two sites.

^bPublished paper also submitted, but not considered relevant.

service oversight, most sites (26/32, 81.3%) reported the same documents reflected local Infection Prevention and Control measures to support service delivery. Twenty-seven individual oversight documents were provided for analysis from 16 sites. Table 2 summarises details of these documents; 20 were governance-related – Trust standard operating procedures ($n=8$), policies ($n=7$), or guidelines ($n=1$), or professional organisation documents ($n=4$); the remaining 7 documents related to logistical aspects of AAI service delivery for example, information leaflets, animal registration forms. Subsequent analysis focused on the 20 governance-related oversight documents. A framework was developed based around two core themes of oversight of AAI services that emerged through familiarisation with the documents: ‘Critical care staff responsibilities’ and ‘Animal handler responsibilities’. In many cases, these two themes reflected the original structure and

organisation responsibilities’. In many cases, these two themes reflected the original structure and organisation of

documents for example, Intensive Care Society Guidance for Animal Assisted Intervention in a Critical Care Setting; even where this structure was not used, content reported within documents naturally aligned to them. Each core theme had several sub-themes related to it reflecting different aspects of oversight for example, documentation and security. Some sub-themes were common across the two core themes for example, welfare and infection control. However, data charting highlighted that distinct information was evident relating to how these sub-themes reflected each of the core themes such that maintaining replication was necessary for example, critical care staff were identified to be responsible for handler and patient welfare, whereas animal welfare was the remit of the animal handler.

A full description of the two core themes and their sub-themes, with accompanying exemplar text taken from source documents, is provided in Table 3. Codes used to develop core and sub-themes are reported in Supplemental File 2 (Table E2). Figure 1 presents an overview summary

Table 3. Core themes, sub-themes, description and exemplar text from documents related to oversight of animal-assisted intervention services.

Core theme	Sub-theme	Description
	Exemplar text	
Critical care staff responsibilities <i>Responsibilities within the remit of, or designated to, critical care staff with regards to delivery of AAI services</i>	Organisation and documentation of visits <ul style="list-style-type: none"> - 'AAI dog visits should be pre-arranged so that the appropriate arrangements and risk assessments can be made' (Site ID 57, Trust SOP) - 'Records must be kept of all patients that have interacted with the AAI team' (Site ID 62, Trust Guidelines) 	Critical care staff are responsible for several logistical tasks related to delivery of AAI services, including pre-visit risk assessment checks (individualised to whichever patient(s) is in receipt of the visit), maintaining detailed records of patients' AAI interaction to facilitate evaluating potential benefit, identifying and recording (using local policy and documentation) any adverse incidents, and ensuring compliance with relevant local policies and regulations.
	Hygiene and infection control <ul style="list-style-type: none"> - 'Patients must have all invasive lines, devices, and open wounds checked and dressed' (Site ID 51, Professional organisation guidelines) - 'Food must be removed from the bedspace prior to visit' (Site ID 65, Trust SOP) - 'Patients who are immunocompromised and needing protective isolation should not be visited by the therapy dog' (Site ID 33, Trust SOP) - 'Decontamination in the form of washing hands with soap and water, sanitiser, or alcohol rub should be carried out by all who have been in contact with the animal' (Site ID 98, Trust SOP) - 'Areas where the animal has visited should be decontaminated appropriately including any equipment that comes into contact with the animal' (Site ID 65, Trust SOP) 	Critical care staff are responsible for hygiene and infection control tasks related to patients, handlers, and the clinical environment. This includes ensuring appropriate dressing of any open patient wounds, removing any food from the patient's bedspace, ensuring that immunocompromised patients are not visited by the therapy animal, maintaining hand hygiene of all involved in the AAI interaction, and ensuring equipment that has come into contact with the animal is appropriately decontaminated.
	Handler welfare <ul style="list-style-type: none"> - 'There should be appropriate support available for the psychological wellbeing of the therapy animal handler' (Site ID 98, Trust SOP) - 'Units must provide induction for handler and therapy dog to ensure all parties are comfortable with environment' (Site ID 65, Trust SOP) - 'Acting as a point of contact for the therapy dog handler and ensuring that they or the therapy dog are not left unsupervised with a patient or in an unfamiliar environment' (Site ID 33, Trust SOP) 	The wellbeing of the therapy animal handler is the responsibility of critical care staff, as they must ensure that appropriate psychological support is in place for the handler, provide an induction to familiarise the handler with the critical care environment, and act as a point of contact to ensure the handler is not left unsupervised. Provision of this welfare support to handlers, enablers them to consequently manage their responsibilities with effectively with regard animal welfare.

(Continued)

Table 3. (Continued)

Core theme	Sub-theme	Description
	Exemplar text	
	Patient welfare	<p>The wellbeing of patients receiving AAI is the responsibility of critical care staff to ensure safeguarding, and to enhance the potential therapeutic benefits of any interaction. This includes informing patients and their families/loved ones about the use of AAI on the site, obtaining their consent to participate should they wish to receive a visit, and ensuring their right to make informed decisions about their care is respected. Patient welfare also includes ensuring those patients with specific allergies to certain animals are not exposed to that animal during any visit. Additionally, critical care staff are tasked with integrating AAI into an individualised care plan with specific goals to support meeting personal rehabilitation and care goals.</p> <ul style="list-style-type: none"> - 'Critical care staff should obtain verbal consent from either the patient or the family for the visit from the therapy animal' (Site ID 98, Trust SOP) - 'The unit must display information that AAI is in use for patients and relatives' (Site ID number 98, Trust SOP) - 'No patients or staff who have been identified as potentially allergic to pets should be exposed to the pet during the visitation' (Site ID 56, Trust policy) - 'AAI should be goal directed with outcomes evaluated as part of an individualised care plan' (Site ID 65, Trust SOP)
Animal therapy handler responsibilities Responsibilities within the remit of, or designated to, animal handlers, with regards to delivery of AAI services	Registration and security	<p>Therapy animal handlers are responsible for ensuring that both they, and their therapy animal, meet all the site's local registration and security requirements upon arrival to an AAI visit. This includes registering with the host NHS Trust volunteering team, ensuring that therapy animals are assessed and approved by relevant organisations, undergoing necessary security checks, and wearing appropriate identification whilst on site. Following this approach ensures the safety of patients and staff, builds trust in the therapy programme, and complies with institutional regulations.</p> <ul style="list-style-type: none"> - 'The handler must be registered with the host NHS Trust volunteering team' (Site ID 13, Trust SOP) - 'The volunteer commits to the following: ensure your animal is registered, assessed and approved by Pets as Therapy' (Site ID 79, Trust policy) - 'All dog owners/handlers must have passed a critical records check to be allowed a visit to the critical care unit' (Site ID 57, Trust SOP) - 'Handler should wear an appropriate ID badge identifying themselves as a volunteer affiliated with the AAI organisation and identifying the therapy dog as theirs. The therapy dog should wear an item (neckerchief, lead or collar) that identifies them as a therapy dog' (Site ID 33, Trust SOP)
	Hygiene and infection control	<p>Therapy animal handlers are also responsible for hygiene and infection control tasks related to the therapy animals. This includes reporting any fouling incidents within hospital premises, maintaining up-to-date animal vaccinations, avoiding visits if the animal has been unwell, ensuring that animals are groomed and free from communicable diseases, preventing the animal's paws from contacting hospital beds directly, and discouraging animal behaviours such as jumping, scratching, and licking.</p>

(Continued)

Table 3. (Continued)

Core theme	Sub-theme	Description
	Exemplar text	
	<ul style="list-style-type: none"> - 'If the animal fouls within the hospital building, it should be cleaned up by the handler and the handler is responsible to report this to a member of staff' (Site ID 98, Trust SOP) - 'The PAT pet owner/handler is responsible to ensure that the dog is discouraged from jumping, scratching and licking' (Site ID 56, Trust Policy) - 'All vaccinations for the therapy dog must be up to date' (Site ID number 62, Trust Guidelines) - 'The therapy animal must be washed and well-groomed prior to any visit' (Site ID 13, Trust SOP) - 'The therapy dog must be free of communicable diseases, parasites, infestations, ringworm, skin disorders and open wounds' (Site ID 62, Trust guidelines) - 'Do not visit if your pet has recently been unwell' (Site ID number 86, 'Handler should avoid therapy animals paws on the bed. If this is unavoidable the paws should be on a single use protective barrier' (Site ID 65, Trust SOP) 	
	Animal welfare	The wellbeing of the therapy animal is the responsibility of the therapy animal handler, as they must supervise them at all times, remove them from any stressful situations, ensure their toileting and feeding needs are met, and ensure they do not consume any inappropriate food items.
	<ul style="list-style-type: none"> - 'All visiting dogs must be kept on a lead and under control at all times' (Site ID 57, Trust SOP) - 'The therapy dog handler is responsible for ensuring the ethical treatment of the therapy dog at all times and must be able to read their dogs body language to identify when the dog is comfortable, uncomfortable or tired' (Site ID 33, Trust SOP) - 'If the animal appears stressed or uncomfortable they must be removed from the situation' (Site ID 65, Trust SOP) - 'The therapy dog handler is responsible for ensuring the therapy dog's toileting and feeding requirements are met. This includes instructing staff not to feed the therapy dog anything other than food or treats they are happy for the therapy dog to receive' (Site ID 33, Trust SOP) - 'The therapy animal must not be fed on raw animal protein' (Site ID 13, Trust SOP) 	

AAI: animal-assisted intervention; SOP: Standard Operating Procedure; ICU: intensive care unit.

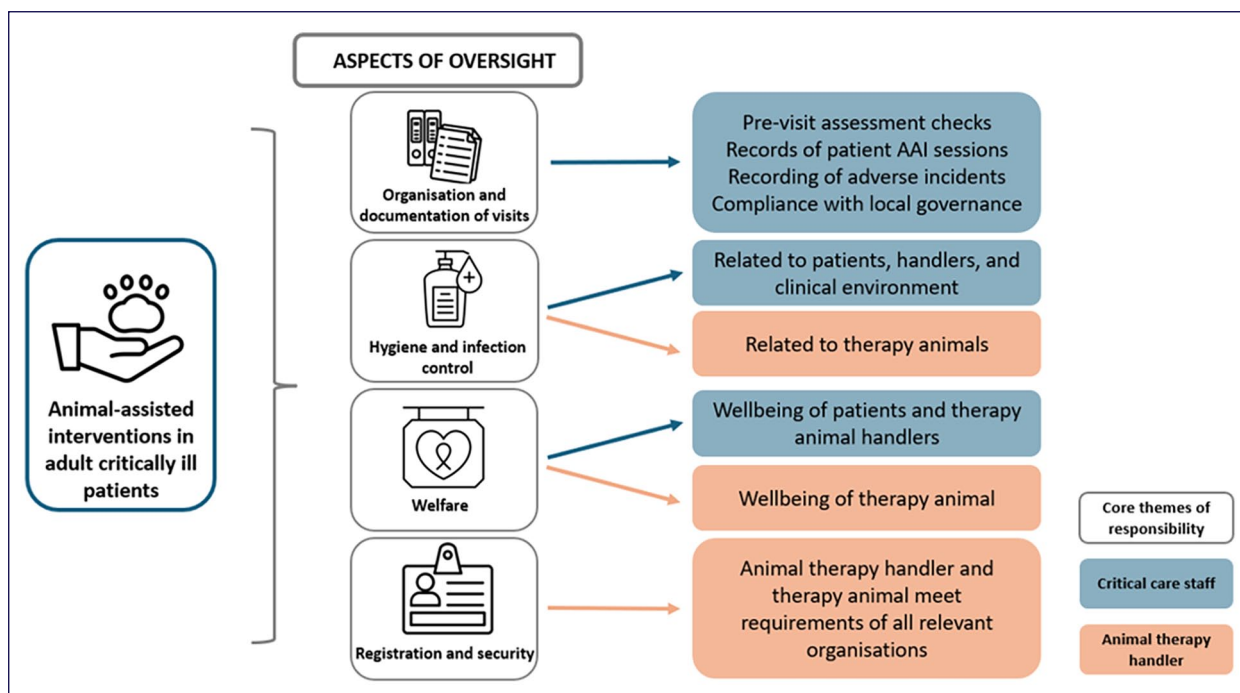


Figure 1. Summary of oversight related to animal-assisted interventions in adult critical care units. Overview summary depicting aspects of oversight related to delivery of animal-assisted interventions in adult critical care units. Aspects of oversight (sub-themes) were the responsibility of both critical care staff (orange) and animal therapy handlers (blue; core themes). Some aspects overlapped but with distinct content detail.

Table 4. Limitations to animal-assisted intervention service provision.

Barrier to commencing service	n (%) of sites (N=34)	Reason for stopping service (where available previously)	n (%) of sites (N=8)
Concern for Infection Prevention and Control	26 (76.5%)	Concern for Infection Prevention and Control	4 (50%)
Lack of funding	12 (35.3%)	Concern from management regarding having animals on the ICU	3 (37.5%)
Understaffing of personnel to support	12 (35.4%)	COVID-19 ^a	3 (37.5%)
Lack of local AAI organisations to link with	11 (32.4%)	Concern from clinicians regarding having animals on the ICU	2 (25.0%)
Lack of time	9 (26.5%)	Lack of access to AAI service personnel/ organisations	1 (12.5%)
Administration/Induction procedures required for hospital volunteers	9 (26.5%)	Previous poor experience	0
Lack of evidence proving beneficial effect	7 (20.6%)	Lack of funding	0
Not a priority ^a	2 (5.9%)	Lack of dedicated critical care personnel to support	0
Patient/family declining the service	0	Patient/family declining the service	0

AAI: animal-assisted intervention; ICU: intensive care unit.

Respondents could select more than one applicable reason hence totals exceed denominators.

^aIndicates reasons provided as 'Other'.

depicting the relationship between core and sub-themes. There were no discernible differences observed when analysing oversight documents depending on category that is, whether the document was self-drafted, locally modified from an independent professional organisation, or wholly adopted from an independent professional organisation.

Sites with no available AAI services

Forty-two sites (74, 56.8%) had no current AAI services available. Barriers to sites commencing services, and reasons for sites stopping services where they had been previously available, are reported in Table 4. Concern regarding Infection Prevention and Control was the most prevalent factor in each case (26/34, 76.5%, and 4/8, 50.0% respectively). Lack of funding and personnel understaffing were other frequently reported barriers to initiating services. Patient/family declining services was not reported as a concern by any site. Of 34 sites that had never had service previously available, the majority had no plans to commence these in the future (22/34, 64.7%); the same was also true for those sites that had previously had services (5/8, 62.5% indicated no plan to recommence). Free text responses provided by sites with AAA services are outlined in Supplemental File 2 (Table E3).

Discussion

This study involved a national UK service evaluation to ascertain availability, characteristics and oversight of AAI services in adult ICUs. Data from two sources, quantitative survey and qualitative document analysis, were assimilated to characterise current service delivery. Our data demonstrate that AAI services were available in nearly half of responding sites. Reflecting the recency of animal therapy into the clinical setting of UK critical care,

most services had commenced in the last 5 years. Oversight documents revealed two core themes of information pertaining to responsibilities of critical care staff and animal therapy handlers. Importantly, all AAI services were reported as provided on a volunteer basis by bedside clinicians, animal handlers, and others who see potential benefit to patients, families, and staff that has yet to be academically quantified but *feels* meaningful. This is consistent with documented efforts to evolve critical care by 'humanising' the ICU environment. The intention of such humanisation efforts are to focus not only on survival and medical treatment, but to also create a culture flourishing for patients, families and staff.²⁵⁻²⁷ The potential for progression from small and unfunded pilot programming (as evidenced by existing AAI service provision) to larger-scale research efforts is consistent with similar initiatives to humanise critical care including end-of-life support programmes,^{28,29} patient navigation programmes³⁰ and music programmes.^{31,32}

Interpretation of findings

Our data demonstrated that most UK ICUs with AAI services available for adult patients reported these to be animal-assisted *activity* services, focusing on interactive-based engagement. Animal-assisted *therapy* services, providing more personalised treatment interventions, were relatively rare. This is consistent with the observation that all services are conducted on a volunteer basis, leaving limited flexibility and availability for more skilled and nuanced interventions of potential therapeutic effect. Additional resources (time and funding) could resolve this, as seen in a recent study in the paediatric critical care population investigating the feasibility of animal-assisted therapy comprising an occupational therapist, psychologist and a therapy dog.¹⁴ Evaluations of therapy sessions (on average approximately 40min duration) across 61 patients revealed significant

reductions in pain, fear and anxiety levels following the intervention against a background of clinical stability, with no adverse effects reported, and subjective positive feedback from all involved. Further evaluation would be valuable for determining how these benefits may then translate into other clinical aspects.

Understaffing of personnel also contributes to operational limitations in AAI service delivery, reported as a barrier by a third of respondents. Furthermore, only around half of respondents reported presence of a designated coordinator or champion. These roles can be particularly important for implementing new innovations with patients albeit their full potential remains underexplored.³³ That said, for overseeing administrative and other coordination aspects of AAI service delivery, the practical advantages to such a role are clear. We did not explore how these roles are currently funded (if available), but speculate they are supernumerary and goodwill, and therefore at risk of limited sustainability with staffing turnover or other workload pressures. In the future, if provision of AAI services becomes established, then resourcing will need to consider administrative support.

Despite concern regarding infection risk being the most prevalent barrier to either commencing new, or having ceased previously available, AAI services, respondents from currently active sites reported no episodes of patient harm including acquired infection. Nonetheless this remains an important factor that warrants continued monitoring in future clinical and research contexts. Similarly, engagement from patients, family, and care partners was evident in responses, and no site reported any negative experiences from AAI delivery. However, as a self-selected, relatively small sample of responses, this would merit further exploration. Understanding the potential for unintended consequences associated with AAI is essential, and we did not capture this in our survey; for example, the experience of patients, visitors or staff who have a fear of, or allergy to, animals – even if they are not directly involved in the interaction, the presence of animals in the environment may be significantly detrimental. Similarly for example, for patients experiencing delirium, confusion, or disorientation, observing the presence of animals may further exacerbate their clinical state. Empirically clinicians should be mindful of any necessary environmental adaptations that may support these scenarios for example, separate physical locations for AAI interactions to occur, as well as careful balance of the potential benefits and harms that could occur. Notably, all AAI services in our data reported use of dogs as the therapy animal, but in other contexts, other animals have been reported of benefit and this could be expanded to explore in future work with critically ill patients.^{34–36}

Many reported AAI services had commenced within the last 5 years. Whilst causal association is not possible to determine, this timeframe aligns with publication of the UK Intensive Care Society Guidance for delivering AAI in critical care settings,¹⁵ and it is possible that publication of this guidance from the national specialist professional organisation may have prompted service emergence. This

guidance document, one which many sites reported as either their primary or locally modified source of service oversight, offers practical instruction on the logistical considerations for offering AAI along with a narrative description of some of the related evidence. However, it is important to highlight that there is currently a lack of definitive randomised controlled trial data to confirm effectiveness of AAI,^{6,13,14,37} and this was cited as the reason for lack of service availability by a fifth of respondents in the current study. As the critical care specialty embraces humanising the ICU environment, culture and experience for the benefit of patients, caregivers, and staff,^{25–27} ensuring a rigorous foundation of evidence to underpin interventions such as AAI will be important for justifying the resources needed for equitable access and delivery of services. A small number of respondents reported ‘lack of priority’ as a barrier to service availability, which reflects this point, and a possible lack of willingness to offer AAI service that may divert capacity away from core services in the absence of demonstrable benefit at present.

Our analysis of oversight documents revealed both individual and shared themes of responsibility for the effective and appropriate delivery of AAI services between critical care staff and animal therapy handlers. Following governance preserves the safety and wellbeing of all participants involved in AAI opportunities and the clinical environment. However, the considerable overlap in content of oversight documents from sites suggests scope for avoiding redundancy and duplication of efforts if nationally generated guidance documents could more easily be approved locally. This would also reflect a move to efficiency within service delivery, which would be invaluable if service upscaling were to occur across the UK at any point.

Critique of the method

This service evaluation benefits from several strengths. Our survey component follows methods successfully used to previously survey the same population of UK ICUs.²⁰ The sampling frame was established from two national registries, and we undertook various steps to ensure rigour of the survey design including internal and external pilot testing, refinement of questions and optimisation of survey platform functionality to facilitate user-experience of completion.³⁸ Missing data were minimal, and contact was made with authors where survey responses were incomplete or required clarification to ensure data accuracy. We disseminated the survey widely via multiple methods including professional organisations and social media and followed-up with repeat reminders during the active timeframe to maximise the response rate. We encouraged responses irrespective of AAI service availability at ICUs, knowing this would be valuable from a national service evaluation perspective.¹⁶

However, despite these approaches our survey response rate after de-duplication was approximately 30%. Typically, a survey response rate of $\geq 70\%$ is considered representative^{19,39} and hence our findings should be interpreted with

caution with regards reflection across all ICUs in the wider sample frame. Absence of data on survey non-responders limits comparison to responders and the potential for response bias,^{39,40} as well as ascertaining reasons for non-response. Common factors such as time and motivation may be causal, but it could be speculated that given the novelty of AAI services in UK ICUs, a large proportion of non-respondents do not currently have services available and therefore perceived the survey as irrelevant. Furthermore, in addition to surveying ICUs, our service evaluation additionally included a detailed analysis of independent oversight documents.^{41,42} This provided contextual information, albeit was also limited to documents provided from half of respondents. Nonetheless, this approach of methodological triangulation, incorporating mixed quantitative and qualitative data collection from two sources, added depth of understanding, meaning, and knowledge to strengthen interpretation and validity of our data and address our study aims.⁴³

For practical reasons, we encouraged a single response from each institution from any healthcare professional who was sufficiently knowledgeable regarding availability of AAI services to contribute to the service evaluation. In this way, we assumed a consistent approach to AAI service availability irrespective of whether a site had multiple ICUs, and we did not capture potentially important variations in the number, size, or specialty of ICUs at any individual site. Overall, this assumption was maintained, albeit we had one example of variability in service provision across different ICUs based on responses from one site. We also limited our data collection to adult ICUs, albeit empirically we are aware of AAI services being delivered in some UK paediatric critical care settings. Future research may consider inclusion of granular service details to reflect bespoke inter-ICU differences. Additionally, we did not gather certain important details on the services delivered by each of the sites. For instance, the online survey lacked items related to the contributions of volunteer dog handlers and healthcare personnel in AAT. Future research should therefore characterise AAI services in greater depth, as this would help identify differences in service delivery across sites and enhance interpretation of findings from different interventions. Nonetheless, we are confident our data are valuable for characterising services where these are delivered, at this relatively early stage of investigation into animal therapy in critical illness in the UK.

Conclusion

In a rigorously conducted national service evaluation, a small sample of responses revealed AAI services to be available in less than half of ICUs, with shared responsibility by critical care staff and animal therapy handlers. There were no documented harms to patients or staff, and only one minor harmful incident reported for a therapy animal. Empirical enthusiasm for, and value of, interventions is countered by current lack of definitive evidence of effectiveness, which should be addressed before wider

implementation of AAI services and the associated resource requirements, is undertaken.

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Credit statement

Sam Wright: Data curation, formal analysis, investigation, methodology, project administration, supervision, writing – original draft, writing – review and editing.

Holly Mcaree: Data curation, formal analysis, investigation, methodology, writing – original draft.

Megan Hosey: Investigation, writing – review and editing.

Kate Tantam: Investigation, writing – review and editing.

Bronwen Connolly: Conceptualisation, data curation, formal analysis, investigation, methodology, project administration, supervision, writing – original draft, writing – review and editing.

Declaration of conflicting interests


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Supplemental material

Supplemental material for this article is available online.

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