Don't Forget The Bubbles

DOG BITES IN CHILDREN

Facilitators Guide

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Topic: **Dog Bites in Children**
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Facilitator level: **ST3 + in ED Setting**
Learners level: **Any health care professional involved in initial assessment of children with injuries (emergency departments)**
Duration: **1- 1.5 hours**

OUTLINE

- **Introduction: 10 minutes plus review of your hospitals local guidelines**
- **Cases: 3x 15 minutes case discussions**
- **Simulation**
- **Quiz: 5 minutes**
- **Take Home Messages: 5 minutes**

PRE-READING FOR LEARNERS

The list of link should be sent out in advance to allow time for people to access the resources at a convenient time:

1. NICE Guideline: Bites - human and animal | Health topics A to Z | CKS | NICE
2. BMJ Article: Pet dog bites in children: management and prevention | BMJ Paediatrics Open
3. Audio Discussion of Management (44mins): Animal Bites in Children | Pediatric Emergency Playbook
4.. The psychological impact: Review of psychological effects of dog bites in children - PMC

INTRODUCTION TO DOG BITES AND CURRENT SOCIAL SITUATION

In the UK 25% of households own a dog, with UK favourite breeds are Labrador, French bulldog and Cocker spaniel [1](note mixed breeds like cockapoos are not included) in Australia their favorite are the Cavapoo, Dachshund and Golden Retriever [2]. There has been an increasing trend of dog bites/attacks that has increased 3-fold over the last 20 years, with only 1/3 of dog bites thought to present to the ED, so the true number is unknown [4]. The majority of which are from family dogs or dogs known to their victim. There were 32 dog fatalities in the UK from 2019-2020 between 2019-2023 [3].

Children, especially those under 5 years are at increased risk of dog bites as they are unable to recognise dog behaviours (fear/anger), where their instinct is to cuddle contrasts with a dogs need for space when emotions are high resulting in biting and injury. In adults' injuries tend to focus on the legs and groin, whereas in children, due to the proportional size of the dog to the child, upwards of 85% of injuries are to the head, face and neck.[4,7]

The reasons for the increasing number of dangerous dog incidents are multifactorial including economic, due to increasing vet bills and cost of food, many dogs seized by South Yorkshire Police require veterinary attention from untreated conditions or being underfed. It is worth noting that neglect of a dog is often found to be linked to the neglect of any children in the household.
This is reflected in the NICE statement "A dog bite in the context of inadequate supervision should raise suspicion of wider neglect". During the pandemic the UK saw an increase in demand for dog ownership resulting in many "lockdown dogs" for which their world was quieter, calmer and more isolated during their key developmental stages (up to 16 weeks). These dogs were not exposed to experiences during this crucial time increasing how often dogs are feeling fear and anxiety – resulting in space avoidance, which children cannot interpret. Some dogs may display no learned behaviour, making them unpredictable.[4]

Banned Breeds in the UK:
In 2024 Bully XL's were added to the banned dog list, which already contained Japanese Tosa, Pit Bull Terrier, Dogo Argentino and Fila Braziliero. Though people can still currently own these breeds if they obtain an exception certificate stating they have been spayed/neutered, wear a muzzle and remain on lead in public in addition to being microchipped, but be mindful there is a number of unregistered dogs.[5]

Japanese Tosa [A]

Pit Bull Terrier [B]

Dogo Argentino [C]

Fila Braziliero [B]

XL Bully [D]

Another consequence of the ban has been a trend towards larger more powerful breeds like the Cane Korso. These dogs have a higher bite strength and have more potential to cause serious or fatal injuries or similar crossbreeds.[4]

Police Involvement/Powers in the UK:
All presentations to the ED involving dog bites should be considered if it needs reporting to the police on 101/online interface. For those that are, a police officer will undergo an in-person visit to assess the animals, their living conditions and make a safeguarding assessment. The aim is to educate and reduce the risk of recurrence, the owner may be given rules to follow such as training or muzzle wearing. In serious cases the dangerous dog act [6] can result in unlimited fines, banned from owning future dogs and even imprisonment with the dogs being seized and destroyed by the police.

The Police are involved in a whole range of preventative and proactive measures, to reduce the number of serious attack incidents such as media campaigns, recording and attending all incidents reported, education in schools and directing owners to further support such as: Blue Cross Responsible Dog Ownership Course.

There are a lot of useful resources out there that we can share with our patients and their families which give tips and information on how to keep children safe around dogs. Some examples of these are below:

https://www.bluecross.org.uk/advice/dog/keeping-your-toddler-safe-around-dogs

https://www.rspca.org.uk/adviceandwelfare/pets/dogs/company/children

https://www.safeguardingcambspeterborough.org.uk/wp-content/uploads/2020/08/6-Dogs-and-Children-guide-to-staying-safe.pdf

CASE 1

Sammy is a 2 year-old-girl who was playing with her family dog when she was bitten on the arm. Sammy is usually fit and well, has no allergies and is fully immunised. On examination her arm show's a red mark but no skin has been broken, she has full range of movement of the elbow and wrist and indicates no pain.

Q1 – What information is important to obtain during history?

- Incident: Was it witnessed? By Who? Where did it happen? What was the child doing just before? What was the dog doing just before? Where did the dog bite (no. of times, location, length of bite). What happened afterwards? Was it an unprovoked attack?

- Dog: Breed of Dog, Dog Owner. Where does the dog usually live?
  Where is the dog now? Have they bitten before?
  How long have they had the dog? Where is the dog from? Is it a family pet?

- First Aid: What first aid has been given so far? Have they had analgesia?

- Child's Medical Hx: Medical History, Medications + Allergies, Immunisation History

- Child Social Hx: Is the family known to social services/family support?
  Who lives in the house with the dog? Are there other vulnerable people (i.e. Children) still with the dog?

- Police: Have they been informed (case number)?

Q2 – Does this need to be reported to the police?

▪ Each case is unique and should be considered on its own merits. There is no set/standardised guideance. Elements to consider include the extent of the injury. Has the dog bitten before? Did the incident take place in public? Was it an unprovoked attack? Is the dog a banned breed?

In this case if the child was younger playing with the family dog by themselves -the level of supervision could be discussed and information shared with the child's health visitor. However, always consider safeguarding/neglect with any child who presents with a dog bite.

Q3 - Does this child require any clinical management?

▪ The child has a full range of movement of the arm with no indication of a fracture, the skin has not been broken.
They can have analgesia as required.

CASE 2

Muhammed is a 6 year-old-boy who was playing at the park with his family, when a stranger's dog came running towards him, jumped up and bit him on the face. The police have been informed, and you have the incident number. Muhammed has no past medical history, has no allergies and is fully immunised.
On examination you see the wound of his face which looks clean and not infected:

A

B

Image from Published Article [F]
Cavalcanti et al, Facial Dog Bite Injuries in Children: A Case Report, International Journal of Surgery Case Reports, 2017, Volume 41; Pages 57-60

Q1 – What examination and documentation is needed?

- Detailed History as documents above (in case 1)

- All wounds/marks should be clearly documented on a body map, clinical photography may also be beneficial as these may need to be used in court.

- Following a full examination of the child's body documenting size/depth/extent of injuries, type of wound, any devitalised tissue or underlying structural damage (tendon, vessels). Assess neurovascular status and range of movement distal to the wound. Document if any foreign body is removed (e.g. teeth), presence of lymphadenopathy, level of contamination and if any indication the wound is infected.

- Further examination of the eyes (range of movement, consider fluorescein) and mouth (looking inside) to assess if any underlying structures have been damaged or if the wound has punctured through to the internal oral cavity (as this would need escalation to specialist teams).

Q2 – How would you manage the wound itself?

- Irrigate the wounds well with normal saline

- From this image, the child's injury to the lip alone would require escalation to plastics/max fax.

- Some very simple wounds can be closed (present early, thoroughly irrigated involving no underlying structure). However, **most** bites (that do not require further escalation to e.g. plastics) are advised to heal without any formal closure such as [8]:

• Bites >24hrs old
• Bites limbs/hands/face
• Deep puncture wounds
• Crush injuries
• Contamination
• Uncertain adequacy of debridement.

Q3 -How else would you manage this clinically?

- Analgesia
- Prophylactic Antibiotics should be prescribed (Co-Amoxiclav, 3 days)[8]

Prophylactic Antibiotics should be prescribed if [8]:

- Wound is visibly contaminated
- Deep puncture or crush wound
- Penetrated to bone/tendon/nerve/ligaments

Prophylactic Antibiotics could be considered if wound has broken skin + bled [8]:

- **Head/Face**, Feet, Hands, Genitals, Areas skin with poor circulation, over cartilaginous structure or near prosthetic joints
- The patient has an increased risk of serious infection, immunocompromised, extremes of ages or prosthetic heart valve.

Choice of Oral Antibiotic [8]:

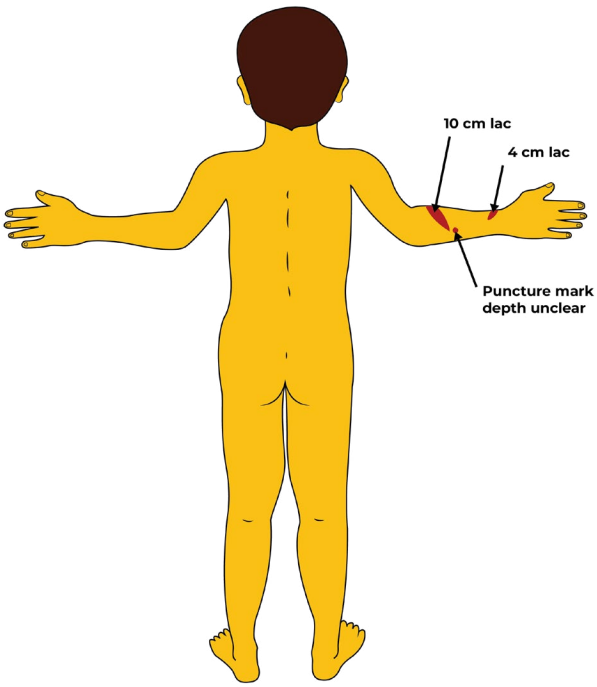
- 1st Line (>1 month - Adults): Co-Amoxiclav for 3 days for prophylaxis and 5 days for infected dog bite [12]. *Always check with your local microbiology guidance.
- Penicillin Allergies
  - <12yrs Co-Trimoxazole
  - 12-17 yrs Metronidazole plus Doxycycline

CASE 3

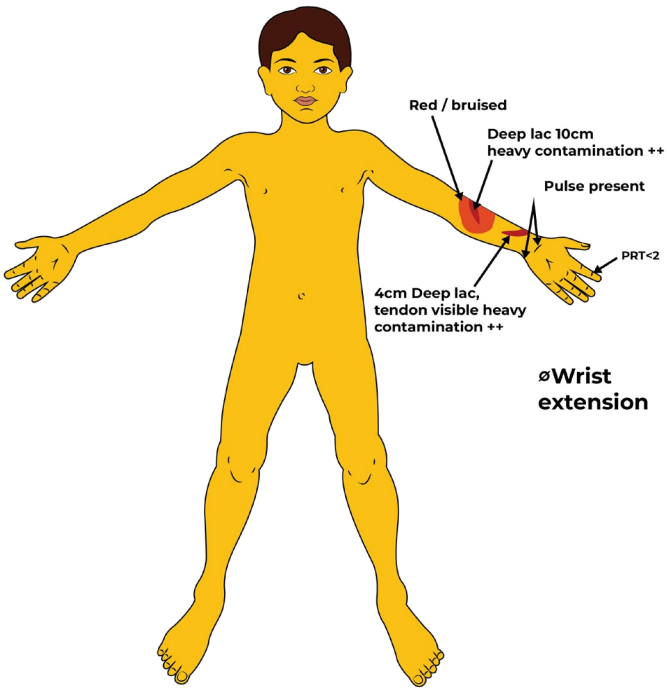
Kyran is an 11 y.o who was visiting the local farm, he had climbed over a fence when a large dog working on the farm bit his arm and wouldn't let go. Eventually the dog released with help of the farmer, the police are aware and have attended the Emergency Department due to the extent of Kyran's injuries.

History notes that Kyran has no medical history of note, has no allergies and is un-immunised. On examination there is a deep laceration across his distal forearm that is contaminated with mud, he is unable to move his wrist and tendons are visible, there is minimal evidence of bleeding and no evidence of vascular injury. His capillary refill distal to the wound is < 2 seconds and his hand is warm, he is reluctant at present to make any movements with his hands.

Young Male Child Posteroanterior



Young Male Child Anteroposterior



Annotated Diagram Image [G]

Q1 – How would you manage this child?

- Initial assessment of A → E approach/ Primary Survey,
- Adequate Analgesia
- Irrigation of any visible contamination
- IV access – antibiotics (co-amoxiclav), bloods (including clotting/ group + save), fluids (if NBM for surgery)
- Tetanus Immunoglobulin and Tetanus Vaccine
- Escalation to specialist teams for surgery, irrigation, debridement, re-construction of structural damages following admission to hospital.

Dog Bite + Tetanus:

Tetanus is the disease caused by the tetanus toxin, there spores are common in the environment including soil. The disease results in rigidity, muscular spasms with case fatality 10-90% and is higher at extremes of age.

Children receive a total of 5 tetanus vaccination providing lifelong immunity (2,3,4 months, preschool + secondary school). It is important to determine if a wound "tetanus prone" or "high risk" as this will determine alongside the child's immunisation status if tetanus vaccine is needed or tetanus immunoglobulin is required [9]:

Tetanus Prone Wounds	High Risk Tetanus Prone Wounds
Puncture injury (i.e. dog bite) from contaminated environment (soil/agricultural setting)	Heavily contaminated likely containing tetanus spore (soil, manure)
Wound containing foreign bodies (i.e. teeth)	Wounds that have extensive devitalised tissue.
Open Fractures	Wound needing surgical intervention but there is a delay of >6hours, even if the wound was minimally contaminated.

Table 30.1 Immunisation recommendations for clean and tetanus-prone wounds

Immunisation Status	Immediate treatment			Later treatment
	Clean wound[1]	Tetanus Prone	High risk tetanus prone	
Those aged 11 years and over, who have received an adequate priming course of tetanus vaccine[2] with the last dose within 10 years. Children aged 5–10 years who have received priming course and pre-school booster. Children under 5 years who have received an adequate priming course	None required	None required	None required	Further doses as required to complete the recommended schedule (to ensure future immunity)
Received adequate priming course of tetanus vaccine[2] but last dose more than 10 years ago. Children aged 5–10 years who have received an adequate priming course but no preschool booster. Includes UK born after 1961 with history of accepting vaccinations.	None required	Immediate reinforcing dose of vaccine.	Immediate reinforcing dose of vaccine. One dose of human tetanus immunoglobulin[3] in a different site	Further doses as required to complete the recommended schedule (to ensure future immunity)
Not received adequate priming course of tetanus vaccine[2]. Includes uncertain immunisation status and/or born before 1961.	Immediate reinforcing dose of vaccine.	Immediate reinforcing dose of vaccine. One dose of human tetanus immunoglobulin[3] in a different site	Immediate reinforcing dose of vaccine. One dose of human tetanus immunoglobulin[3] in a different site	

1. Clean wound is defined as wounds less than 6 hours old, non-penetrating with negligible tissue damage.

2. At least 3 doses of tetanus vaccine. This definition of "adequate course" is for the risk assessment of tetanus-prone wounds only. The full UK schedule is five doses of tetanus containing vaccine at appropriate intervals.

3. If TIG is not available, Human Normal Immunoglobulin (HNIG) may be used as an alternative.

Dog Bites & Rabies:

The UK is considered a “no risk” country including dogs from the UK there is no indication for a vaccine. If the child was bitten abroad or from a dog who has come from abroad each case should be consider separately:
Guidelines on managing rabies post-exposure (January 2023)

Q2 – What imaging may you consider?

- Consider an Xray to look for fractures and presence of any undetected foreign body

SIMULATION NAME: EXTREMITY HAEMORRHAGE – DOG BITE

PATIENT DETAILS:

Name: Ben Smith
Age: 9 years 3
ID No.: L1234567
Weight: 30kg

SIMULATION TIMINGS:

Pre-brief: 2 minutes
Scenario: 13 minutes
Debrief: 15 minutes

LEARNING OBJECTIVES:

1. Manage life-threatening limb trauma including use of celox +/- tourniquet
2. Perform a primary survey - cABCDE
3. Explain rabies, tetanus and antibiotic requirements
4. Understand dog bite safeguarding protocols

SYNOPSIS:

9 year old male brought by ambulance after dog attack with significant wound to leg resulting in catastrophic extremity haemorrhage
Deteriorates if haemorrhage not stopped with celox and/or tourniquet, though not to point of MHP/arrest (not focus of this sim).
Once cABCDE managed, rest of primary survey unremarkable other than a few minor bite/puncture wounds.

PATIENT HISTORY

Bitten by family dog (medium size mixed breed) on leg when playing in living room, dad in room but did not see exactly what triggered attack – dog was asleep, dad thinks maybe Ben stood on him by accident?

Family and Social History:
No family history of note.
Household – mum, dad, 3 year old sister and Ben. 1x dog.
Non-smokers.

Current Medications:
Nil regular
NKDA

EXPECTED ACTIONS:

1. Set up resus, allocate roles, WETFLAG, drugs
2. Think about blood/MHP
3. Take paramedic handover
4. Recognition of catastrophic haemorrhage
5. Use of celox +/- tourniquet *Deteriorates until done
6. Cannulate
7. Complete primary survey once catastrophic haemorrhage under control
8. Gives analgesia
9. Gives IV antibiotics
10. Requests imaging
11. Calls for T&O + plastics review
12. Discusses police/social

DOCUMENTS, EQUIPMENT AND SET UP REQUIREMENT:

- Sim mannikin
- Wounds moulage
- Blood stained bandages
- Red fluid + giving set to mimic arterial spurting
- Celox
- Tourniquet
- Sim cannula
- Drugs – blood, TXA, fentanyl, ketamine, morphine, co-amoxiclav

CANDIDATE BRIEFING:

An alert call has just been received with the following ATMIST. 3 mins until arrival.
Handover: Ben, NF&W, NKDA, attacked by family dog, multiple bites but most significant injury to leg with blood everywhere on scene. Just around the corner so scooped and ran, some direct pressure to the leg but still bleeding profusely despite this. No meds given.
Obs as per ATMIST. Dad speaking to police outside resus, will come in shortly.

A – 9 year old male
T – 10 minutes ago
M – Dog bite
I – Leg (unilateral)
S – HR 132, BP 92/58, RR 22, Sats 96% air
T – Direct pressure to leg wound

SCENARIO PROGRESSION

Parameters	Presentation	Deterioration	Resolution
SpO2	96%	94%	97%
RR	22	24	19
Chest Sounds	Clear throughout	Clear	Clear
Oxygen support	Air	Air	Air
HR, Rhythm, Pulse	132	157	108
BP	92/58	81/43	96/62
CRT	2 seconds	4 seconds	2 seconds
Temperature	37.1	36.9	37.3
Pupils	4+/4+	4+/4+	3+/3+
Eye-opening	Spontaneous	Spontaneous	Spontaneous
AVPU	A	A	A
Skin Appearance	Pink	Pale	Pink
Pain	10	10	5
Parent remark	Crying/screaming	Mildly agitated	Upset but calm

PROMPTS AND QUES:

That leg's bleeding a lot through that dressing

Can we stop that bleeding somehow?

Do we need to call for help?

DISCUSSIONS:

What would we class as catastrophic haemorrhage?

Would this patient need Abx/tetanus/rabies management?

What are the police/safeguarding implications?

SCENARIO NOTES:

- Assessment findings = significant leg wound with bone exposure and arterial catastrophic haemorrhage resolved with celox and/or tourniquet, rest of primary survey NAD, 2° survey = multiple minor bite/puncture wounds that do not require immediate treatment
- If progressing well through management of haemorrhage, dad can come in and ask about dog bite Mx and antibiotics/tetanus/rabies.

DEBRIEF NOTES FOR CLINICAL MANAGEMENT:

- Injury patterns = under 5s likely to have head/face wounds, older children likely limb injuries
- Extremity haemorrhage management = direct pressure → compression bandage → haemostatic agent → tourniquet
- Imaging choice = CT angio if concerns for vascular injury, X-ray can help with fractures and foreign bodies
- Abx (co-amoxiclav) if significant/deep tissue damage, no rabies risk if UK dog, unlikely tetanus unless dog recently routing in soil
- Police and social services must be informed if dog is banned breed, attack is unprovoked, dog has bitten before, or it is a significant attack

QUIZ QUESTIONS: (10 MINUTES)

Question 1.

Do all dog bites need to be reported to the police?

Answer 1 - As previously stated each situation is unique and needs to be assessed, each case should be carefully considered if neglect of the child has occurred. Of the three cases discussed in this module, the authors of this module would report cases 2 and 3, the first case would depend on if any concerns were raised on history taking or examination of the child as a whole.

Question 2.

Which dog bites require antibiotic treatment?

Answer 2 - Wounds that are contaminated, deep or have damaged underlying structure (e.g. tendons). Antibiotics should be considered if the wound is to the head/face, feet/hands or areas of skin with poor circulation, over cartilaginous structure or near prosthetic joints. Patients have increased risk of serious infection, immunocompromised, extremes of ages or prosthetic heart valves.

Question 3.

Which dog bites require tetanus vaccinations?

Answer 3 - Depends on the combination of the child's immunisation status and degree of the wound. Tetanus prone includes contamination (soil/agriculture), open fractures or presence of foreign bodies. If the wound is heavily contaminated, has extensive tissue damage or there will be a delay to surgery they need immunoglobulin also.

Question 4.

How can dog bites be prevented?

Answer 4 - Education is the key to reducing the risk of dog bites. Outside the home children should be taught not to approach strangers' dogs, not all dogs are like their dog at home. Children should not approach dogs when they are eating or sleeping. Encourage gentle interaction – no pulling, grabbing or sitting on a dog. Children and dogs should not be left alone in a room with a dog.[10,11]

Take home tips (learning points)

1. **A**lways consider potential wider safeguarding around all dog bites
2. **B**etter left alone, the majority of bites should be left to heal with no formal closure
3. **C**heck the child's immunisation status
4. **D**oes your ED have a Dog Bite Proforma?
5. **E**ducation of the child and family on how to prevent dog bites in the future

REFERENCES

1.Most popular dog breeds UK according to KC registration | Horse & Hound

2. 23 Most Popular Dog Breeds in Australia in 2025 – Dogster

3.Deaths by dog attack in the UK 2019 to 2023 including all context of death - Office for National Statistics

4.Sheffield Education Teaching – Speech Paul Jameson from South Yorkshire Police Dangerous Dog Team (November 2024)

5. Controlling your dog in public: Banned dogs - GOV.UK

6. Controlling your dog in public: Overview - GOV.UK

7. Pet dog bites in children: management and prevention | BMJ Paediatrics Open

8.Bites - human and animal | Health topics A to Z | CKS | NICE

9.The Green Book on immunisation - chapter 30 tetanus

10.6-Dogs-and-Children-guide-to-staying-safe.pdf

11.Keeping your toddler safe around dogs | Blue Cross

12. Co-amoxiclav | Prescribing information | Bites - human and animal | CKS | NICE

PICTURE REFERENCES

A. Image of Japanese Tosa: A short history of the 'dangerous dog' and why certain breeds are banned - BBC News

B.Image of Pit Bull and Fila Brasileiro: 4 Banned Dog Breeds in the UK (With Photos)

C.Image of Dogo Argentino: Why are Dogo Argentinos banned in the UK? | The Sun

D. Image of XL Bully: What is the XL bully ban and how dangerous are the dogs? - BBC News

E.Image of Case 1: CGI Created Image: https://chatgpt.com/s/m_688e4504246c819184228e005e5d78bd

F.Image of Case 2: Cavalcanti et al, Facial Dog Bite Injuries in Children: A Case Report, International Journal of Surgery Case Reports, 2017, Volume 41; Pages 57-60 Facial dog bite injuries in children: A case report - ScienceDirect

G.Image of Case 3: Hand drawn diagram of patients injuries. Paediatric Body Map from Whittington NHS Trust: https://www.whittington.nhs.uk/default.asp?c=38594&print=1

H.Dog Bite Simulation, Written by colleague Frankie Bevis (West Midlands ED Trainee)

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