



Public Health
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Urgent dental care Evidence review

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Executive summary

In 2016, NHS England reviewed unscheduled dental care and found wide variation in the ways services were accessed, delivered and quality assured. It was recommended that urgent dental care should be transformed in line with the transformation of urgent and emergency care services more generally and that a commissioning standard was needed.

This rapid review of the literature on urgent dental care included over 200 studies. It has reviewed definitions, provided details of the socio-demographic characteristics of patients, described the methods of assessing current service provision, summarised the literature on the patient journey, reviewed the different aspects of the models of care, synthesised the varying elements of quality of urgent care and searched for literature on the interface between urgent dental care services with other health services. It has provided evidence to inform the development of the commissioning standard for urgent dental care services and identified research gaps.

There remains a need to evaluate which of the different service delivery models provide optimal access, effective care and best patient outcomes in future.

1. Introduction

NHS England is responsible for commissioning urgent dental care and this duty is currently met using a range of service designs. In 2016, NHS England reviewed unscheduled dental care and found wide variation in the ways services were accessed, delivered and quality assured. It was recommended that urgent dental care should be transformed in line with the transformation of urgent and emergency care services more generally and that a commissioning standard was needed. This report describes a rapid review of the literature on urgent dental care to inform the development of the commissioning standard for urgent dental care services.

The aim of the rapid review was to review the peer-reviewed and grey literature on urgent dental care. The objectives were to:

- define urgent and unscheduled dental care
- describe the way local needs for urgent dental care have been assessed
- summarise the methods of assessing current service provision
- describe the nature of the patient journey through urgent dental care services
- outline the existing models of care
- describe the quality standards of urgent dental care used
- summarise the interface between urgent dental care services and other health services

2. Method

Database searches were carried out from 1997 to 2017 of MEDLINE, Embase, NICE evidence, HMIC and Health Business Elite using free text and MeSH terms individually and combined with Boolean operators. The search strategy included using the following terms: dental care, health services, emergency services and emergency care. The complete search strategy is available in Appendix 1. The publication types included in the search were primary (all study designs) and secondary evidence, opinion pieces, reports, factsheets and guidance documents.

To ensure the review was as comprehensive as possible to inform the commissioning guide, an attempt was made to identify all relevant literature, based on the objectives of the review and regardless of language. Duplicates were recorded and removed before titles and abstracts of the remaining articles were reviewed. Where titles and abstracts appeared to be relevant, the full text was obtained for inclusion in the review. Reference list searching of a scoping review was also conducted.

3. Results

The search strategy yielded a total of 833 records, of which 233 were duplicates. The remaining 600 titles and abstracts were screened. Following this screening, 216 full text articles were obtained for inclusion in the final review (Figure 1). These articles included several review articles, notably a scoping review of access to urgent dental care (1). So review articles were cited, rather than the individual studies they included.

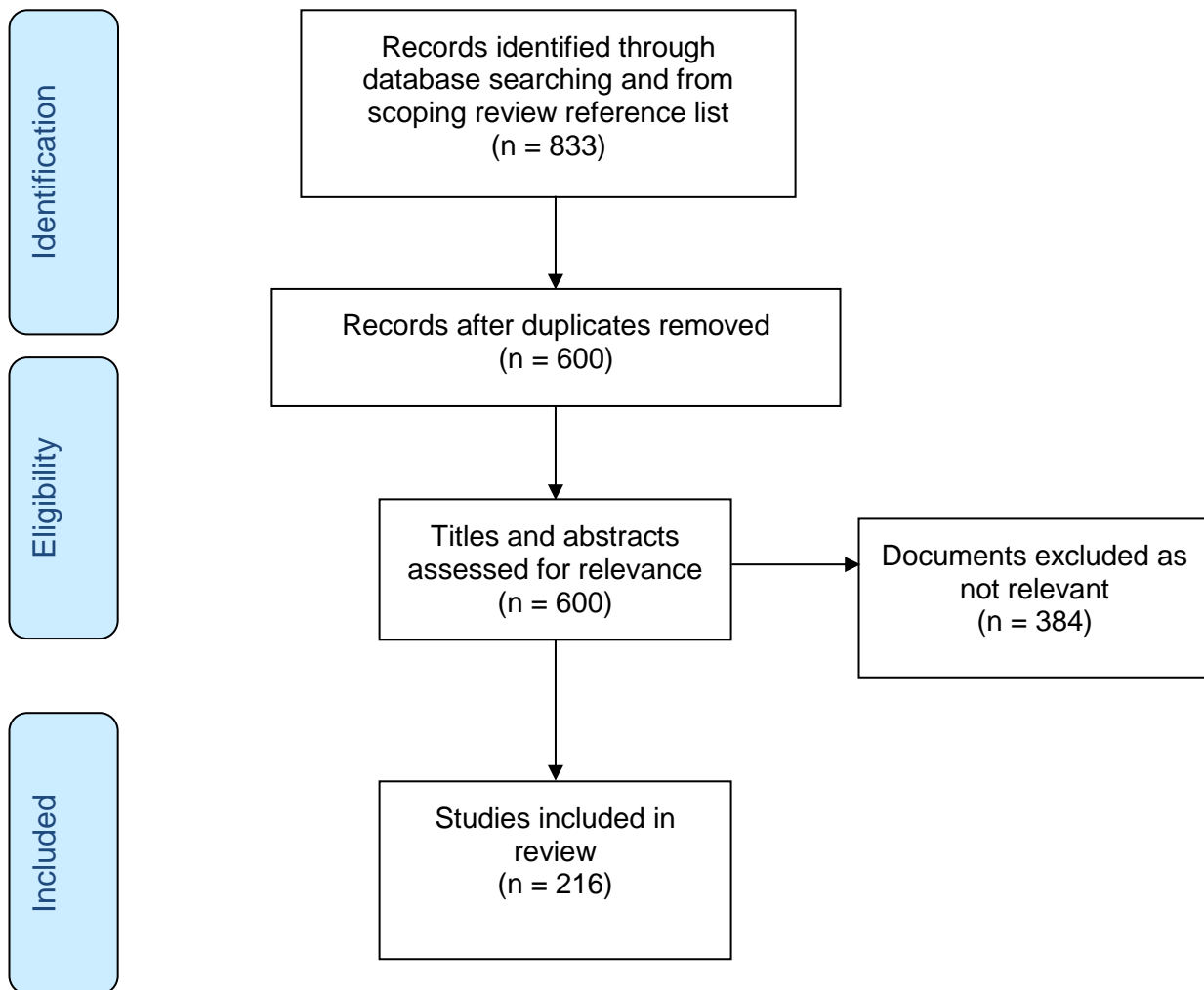


Figure 1. Flow diagram of the results of the search strategy

3.1 Definitions

Various different terms, definitions and classifications are used in the literature, NHS reports and NHS regulations to describe dental care that is not foreseen and/or which happens outside of usual office hours.

The term **unscheduled** dental care has been used recently to describe emergency or urgent dental problems that may present within or outside of routine working hours (2). However, within older dental literature and NHS regulations the term **unscheduled** dental care is rarely used. Instead, definitions for urgent or emergency dental care are provided. Within this review, the terminology used by the authors of the included studies has been adopted.

In addition, in some reports distinction is made between care provided to patients registered with a dentist and that provided to non-registered patients. This distinction is

made mainly as a function of different providers being responsible for the provision of unscheduled care to these 2 groups. In other reports there is no distinction made according to registration status¹.

3.1.1 Classification of dental emergency, dental urgent and non-urgent dental condition

National Health Service (General Dental Service Contracts and Personal Dental Service Agreements) Regulations 2005 defined urgent treatment as meaning a course of treatment that consists of one or more treatments listed in Schedule 4 of the NHS Charges Regulations (urgent treatment under Band 1 charge) that are provided to a person in circumstances where:

- a) a prompt course of treatment is provided because, in the opinion of the contractor, that person's oral health is likely to deteriorate significantly, or the person is in severe pain by reason of his oral health condition
- b) treatment is provided only to the extent that is necessary to prevent that significant deterioration or address that severe pain

The Department of Health Factsheet 7 in 2005 (3) provided a dental urgent classification as patients who require urgent care are those requiring attention for:

- severe dental and facial pain not controlled by over-the-counter preparations
- dental and soft tissue acute infection

The same factsheet provided a classification of a dental emergency: patients who require emergency care are those requiring immediate attention in order to minimise the risk of serious medical complications or prevent long-term dental complications. Their condition means they are most likely to present in accident and emergency (A&E) departments with:

- uncontrollable dental haemorrhage following extractions
- rapidly increasing swelling around the throat or eye
- trauma confined to the dental arches

Factsheet 7 goes on to describe how some patients are currently accessing care from out of hours services who are not in pain and present for treatment regarding non-urgent problems. This may include:

- patients not in pain
- aesthetic problems (dislodged crowns and bridges)

¹ There is currently no formal registration of patients by NHS dental practices in England.

- patients with broken dentures
- patients with hospital referral letters
- patients requiring permanent restorations
- non traumatic problems with orthodontic appliances
- patients who have no significant pathology
- patients requiring a second opinion
- patients using urgent dental services as their regular dentist
- patients requiring surgical extractions (wisdom teeth) and are not in pain

The factsheet states that the term 'out of hours' does not refer to a fixed universally agreed period but refers to services provided outside the scheduled opening hours of a particular surgery (3).

More recently, NHS England has highlighted the need for dental emergencies to be clearly classified (2).

3.1.2 Definitions provided by the Scottish Dental Clinical Effectiveness Programme

In 2007 the Scottish Dental Clinical Effectiveness Programme (SDCEP) developed guidance on emergency dental care which was later followed by guidance on Management of Acute Dental Problems (4). SDCEP provided the following definitions: Urgent and emergency oral conditions are those likely to cause deterioration in oral or general health and where timely intervention for relief of oral pain and infection is important to prevent worsening of ill health and reduce complications.

SDCEP included timescales for use with its guidance:

- emergency care – arrange for the patient to have contact with a clinical advisor within 60 minutes and subsequent treatment within a timescale that is appropriate to the severity of the condition
- urgent care – advise the patient to seek dental or medical care as indicated within 24 hours unless the condition worsens
- non-urgent care – advise the patient to see a dentist within 7 days if required unless the condition worsens
- self-care – the patient should be able to manage the problem without the need for further involvement of a healthcare professional, however, advise the patient that if the symptoms persist, or worsen, they should contact a dentist or general medical practitioner

They specified the out of hours period is 18.00 to 08.00 hours during the week and throughout the weekend.

Within the SDCEP guidance on the Management of Acute Dental Problems decision support flowcharts are provided (madp.sdcep.org.uk/index.html) based on commonly presenting problems indicating whether they are likely to require emergency, urgent, non-urgent or self-care (5).

3.1.3 Summary of definitions

In summary, NHS England has highlighted the need for dental emergencies to be clearly classified (2) with some work conducted in this area by SDCEP (5) but no other definitions were identified from the dental literature.

In this rapid review the terms used by the authors will be retained when describing the results of their work.

3.2 Assessing local needs

While many studies have described the profile of patient attending urgent dental services there have been few studies which have compared the demographic characteristics of people needing or accessing urgent dental care with the wider population.

The next section will describe the demographic characteristics and patient groups reported in the literature as needing or accessing urgent dental care services.

3.2.1 Age

Age has been studied with younger adults found to use urgent dental services more than other age groups in the UK (1). Patients aged 24 to 59 years used the service most frequently compared to the proportion of 24 to 59 year olds in the population. Specifically, the highest use was among those aged 19 to 29 years (6).

3.2.2 Social deprivation

People living in the most deprived areas experience the poorest oral health. Several papers have identified the increased demands for urgent dental care from people living in deprived areas or from low socio-economic groups (7). For example, a study from Australia estimated the rate of patients (per thousand head of population) requesting emergency care was 2 to 4 times higher for those in the most deprived areas compared to the population as a whole (8).

3.2.3 Employment characteristics

Urgent dental services were found to make access to dental treatment easier for manual workers and those with irregular shift patterns (9). However, studies investigating the profile of users of urgent dental care services have found in some areas urgent dental care is used primarily by commuters while in other areas it is used by local residents (1).

3.2.4 Dental attendance patterns

Several studies, including studies from the UK, have described dental attendance patterns of those attending urgent dental services. Pain was the most common presenting complaint (10-12). In 2006, a study of 2 out of hours emergency dental services in London found the main reason for choosing this service to be the inability to access another emergency dental service (42%). Service users felt the emergency dental service was easier to get into than their own dentist (10).

An investigation of the use of a dental emergency clinic in Newcastle in 2013 found 46% of patients reported having a general dental practitioner (GDP), 33% had attended the service previously and 13% had consulted the service for the same problem (11). A study of one walk-in emergency dental service in London in 2014 found 51% of attenders had tried to make an appointment with a dentist prior to attending the emergency service and 21% of patients with a GDP reported difficulty accessing urgent care at their dental practice (12).

These 3 studies suggest the assessment of local need for urgent dental care should include:

- consideration of the availability of scheduled general dental services as they appear to be closely related
- a need to identify and support frequent users to seek routine care - this recommendation was recently made by NHS England (2)

Similar findings are reported in Australia (13), Canada (14) and in the US (15).

3.2.5 People who are homeless

People who are homeless tend to access urgent dental care services due to drug dependency problems, affordability and fear of the dentist (16-18). A UK study of people who are homeless found 45% stated they only attended dental services when in pain. A questionnaire survey of dental professionals as part of this study suggested dedicated dental clinics for homeless people were most appropriate (17).

3.2.6 People with disabilities

Emergency care should be available on the same basis for people with disabilities as the general population. Disabilities include learning disabilities, physical disabilities and mental health problems (19, 20). Factors to consider in the provision of emergency care for people with disabilities include the necessary training and skills of staff, arranging transport, with additional considerations for people with physical disabilities of wheelchair access and the availability of a hoist.

3.2.7 People living in care homes

National Institute for Health and Care Excellence (NICE) guidance on the oral health for adults in care homes (21) states that health and wellbeing boards should ensure local oral health services address the identified needs of people in care homes, including their need for treatment and to identify gaps in provision. This guidance includes emergency and urgent out-of-hours dental treatment.

3.2.8 People with pre-existing medical conditions or on medications

Patel and colleagues found 34% of patients presenting to an emergency dental service in Manchester had one or more medical condition with 29% taking prescribed medication (22). The authors suggested it was important that dentists have an adequate knowledge about these conditions and the implications of these for emergency dental care.

3.2.9 People with dental anxiety

A study published in 2005 in Newcastle (23) found 43% of patients attending an emergency dental clinic cited fear or nervousness as a reason for delaying making a dental appointment with 56% of patients stating they would like to have sedation if it were available. Baker and colleagues in a study of patients attending an emergency dental clinic in Devon found 15% of males and 32% of women had dental anxiety scores which would suggest severe dental anxiety (24).

3.2.10 Other patient groups

When assessing local need, several other patient groups were identified from the literature as having specific implications for urgent dental services:

- prisoners (25)
- refugees (26)
- asylum seekers (26)

- those living in rural locations (1) as these patients tend to delay accessing urgent dental services until their symptoms are worse (27)
- people living in rural areas attended the dentist less frequently and were more likely to delay seeking urgent dental care than those living in urban areas

3.2.11 Summary

In summary, the literature suggests that when assessing the need for urgent dental care services socio-demographic characteristics and particular patient groups should be considered. Studies of predictors of care seeking behaviours of individuals using unscheduled care identified symptoms, dental anxiety, knowledge of services, changes in circumstances, costs, having a disability and living in rural areas as key predictors (1, 15).

However, few studies have compared the characteristics of service users to the wider population. Research of this kind would help determine the equity of access, that is whether people with the greatest need for urgent dental care are accessing services.

3.3 Methods of assessing current service provision

Current service provision has been assessed or reviewed in a number of ways both on a national scale (in the UK in 1998 (28) and in Scotland in 2010 (29)) and locally through activity data, questionnaire surveys and focus groups. The volume of patients seen and types of treatments provided have been the most frequently evaluated aspects of current service provision.

In 1998 a telephone interview survey was conducted of 104 of the then 124 UK health authorities about weekday and weekend out of hours provision and arrangements for registered and unregistered patients. This survey found wide variation between health authorities in their arrangements (28).

In 2010, NHS Quality Improvement Scotland (29) produced a review of out of hours emergency dental services in Scotland based on a self-assessment framework and a process of external peer review. The services provided by NHS Boards were reviewed against a standard developed from the SDCEP guidance 2007.

Evans and colleagues (30) described how focus groups were used to review the current provision of, and problems with, dental out of hours emergency provision in Newcastle. A consensus conference, involving general dental and medical practitioners, was used to develop options for the provision of such services. The authors concluded that the most appropriate arrangement was for a centralised service available to all patients (both those registered and not registered) delivered from a secure location, in

conjunction with general medical practitioners, using nurse-led triage and linked to NHS Direct to improve integration with other out of hours primary care services (30).

Topping (31) evaluated a pilot out of hours project in Fife using information on calls, the outcomes of triage, feedback from the out of hours dental teams and questionnaires investigating patients' experiences.

A performance indicator used in a study in Brazil of different local dental services was the percentage of dental emergency consultations relative to the total number of dental consultations (32).

3.3.1 Summary

In summary, different methods of assessing current service provision have been employed to provide information to commissioners which capture the views of the key stakeholders, namely patients, dental teams, medical services and unscheduled dental care providers.

3.4 Patient journey

The literature overall would suggest the journeys for patients who are undergoing a course of treatment with a dentist already and those who are not differ. As expected by the nature of this research question most of the studies were qualitative studies or questionnaire surveys of patients.

A qualitative study conducted in London in 1999 (33) found patients at an emergency dental clinic reported repeated attempts to seek care from either their own dentist or different dentists before obtaining care from the clinic. They described having to 'shop around' for dentists to find a service with capacity that could treat them quickly and that could provide treatment which effectively relieved their symptoms. They reported being issued with prescriptions for antibiotics by dentists and doctors and also seeking advice from pharmacists (33).

A qualitative study of emergency dental services in Cardiff in 1999 (34, 35) found that users of these services wanted advice and reassurance as much as relief from symptoms. The author concluded that effective and sympathetic dentist-patient communication was an important feature of such services (34, 35).

Several quantitative studies have identified possible explanations for why patients do not use unscheduled dental services but seek care from A&E or from a general medical practitioner. One of the main factors seems to be patient charges and the fear of the cost of attending a dentist is leading patients to seek care which is free (12, 36, 37).

3.4.1 Summary

In summary, the scant literature on patient journeys to and through urgent dental care services suggests confusion among patients about how to access urgent dental care and attempts to source help from different settings. Patients wanted definitive treatment provided in a timely fashion by a team with good communication skills. The fear of the cost of dental services led patients to choose services such as A&E and general medical practitioners which are free of charge.

3.5 Models of care

NHS England's statutory duty to ensure provision of urgent and emergency dental care for people without a dentist or unable to access a dentist is met using a range of service designs (38). However, little is known of the relative benefits of different models of care. Previous evaluations have tended to focus on a single service (7) rather than comparing different configurations (1). There have been no studies comparing different models of care since they were reconfigured in England in 2006 and no economic evaluations. No information is available on the most equitable models of care of vulnerable groups (1).

Only one study has compared different models of care including a hospital-based walk-in service, community dental service based walk-in services, telephone-access GDP rotas for registered patients and telephone-access GDP rotas for registered and unregistered patients. This study was conducted in South Wales in 1999/2000 (39). The outcomes of self-reported oral health status, dental pain and patient satisfaction were assessed. No consistent differences were found between the 4 different service models for self-reported oral health status and dental pain with a high proportion of patients from all service models reporting little or no improvement (39).

While patients appeared to be satisfied overall, there was relative dissatisfaction with the accessibility of all services, particularly the walk-in services. The authors suggested this paradoxical finding may be due to patients having to attend an appointment to obtain advice, rather than be given advice over the telephone (40). The limitations of this study were the small sample size and low response rate (39) (40).

This section of the rapid review will cover:

- i) patient triage
- ii) patient information including signposting and advice services
- iii) appointment booking
- iv) treatments available

However, communication between different elements of the urgent care model is important as failures within the urgent care pathway can disrupt the patients' journey through the system.

3.5.1 Triage

The use of triage has been advocated to facilitate provision of advice and prioritise the use of the 'dentist-hours' to those needing treatment (1). Appropriate triage is important for optimal patient outcomes and tends to be provided, most commonly via telephone. Several different models of telephone triage have been identified including generic triage (via services like NHS 111 or its predecessor NHS Direct) and/or dental specific triage provided by a dentist or dental nurse.

In 2010/2011 NHS Direct undertook 12.5 million assessments through its core service; 8% of all calls in the traditional out of hours period were dental problems (41). To improve the handling of dental problems by a generic call handling service Yorkshire Ambulance Service used interactive voice recognition to stream calls from a call handler to a dental nurse. In London dental nurse triage was procured to receive information from NHS 111, carry out a clinical telephone triage using dental algorithms, provide information to callers and allocate to same day or next day slots or signpost to an NHS dentist. This service was due for phased implementation from 2016. The West Essex model involved an on call dentist providing the triage (2). The use of clinical prediction tools has been advocated to help triage if such tools are designed to be acceptable to dental services and operate within their systems (42, 43).

3.5.2 Patient information including signposting and advice services

There has been little research about patient information and urgent dental care despite suggestions in the literature that patients know little about available services (44) and how to contact them (38). A survey in London established that service users found out about the service from multiple sources, of which family and friends were the most common source (30%) (10).

Healthwatch, in their report in 2016 (45) on access to dental services, highlighted the problem of the inaccuracy of patient information on the NHS website and the need for this to be kept up-to-date and correct for all times of day. However, they described the lack of a contractual arrangement for dental practices to keep the NHS website information up-to-date. They also suggested the need for urgent dental care services to be signposted from other urgent care services (45).

NHS England's quick guide to the best use of unscheduled dental care services includes checklists about patient information for dental providers of routine and urgent care (2). Additional patient information suggested was information about the

costs of treatment and also to ensure informed consent was obtained from patients when diagnosis and treatment is carried out at the same appointment (46, 47).

A recent study of patient information provided by dental practices (36) recommended that they need to have practice voicemail messages that include specific details of how patients can source advice or help out of office hours and that practice websites should also include this information. The specific information suggested included:

- practice opening hours
- telephone number of the regional out of hours emergency dental service
- NHS non-emergency number (111)
- specific advice on the management of post-operative bleeding, pain of dental origin and avulsion (when a tooth is knocked out)
- advice on when to seek immediate medical advice
- details of the nearest A&E department

In terms of advice services, while these have the potential to support self-care, it has been argued that due to the socio-demographic profile of patients using urgent dental care services they may not be well placed to support themselves (36).

However, models of urgent care should not be viewed in isolation as the interface between routine and urgent care is important as will be briefly described in section 3.7.

3.5.3 Appointment booking service and e-referral

Again, there is surprisingly little research about appointment booking or e-referral to urgent dental care services.

In their report in 2016, Healthwatch (45) stated that sufficient appointments should be made available to satisfy the need for unscheduled care. An opinion piece describing the medico-legal consideration of urgent dental care suggested that the required duration of appointments varied depending on the nature of a patient's complaint but sufficient time was needed for appropriate diagnosis and management. The author stated that insufficient time can result in sub-optimal patient outcomes including unresolved symptoms and repeat attendance at urgent care services. In terms of appointment booking they highlighted the importance of good communication between the triage service and clinical service and provision of patient information, including treatment costs (46).

3.5.4 Available treatments

As previously stated, the socio-demographic characteristics of attendees of urgent dental care would suggest these patients to have poor oral health and high treatment

needs (7) with pain the most common presenting complaint (10-12). Extractions appear to be the most commonly required procedures (48). There is also a high proportion of patients with dental anxiety which would suggest anxiety management services should be made available (23, 24). Other papers in the literature refer to the importance of the provision of treatment for:

- dental trauma, particularly in children (49)
- orthodontic emergencies such as soft tissue discomfort and appliance breakages (50)
- emergencies under general anaesthesia for people with learning disabilities (19, 20)

Apart from these specific aspects of treatment, the recurring theme in the literature is the need for definitive treatment. The term definitive treatment is used to differentiate between treatment which relieves symptoms and prevents recurrence of the condition (51) from visits where antimicrobials and analgesics alone are provided.

3.5.5 Summary

In summary, there has been little research into which service delivery models of urgent care provide improved access, effective care and value for money. The need for urgent care services to provide definitive treatments is a recurring theme in the literature. The issue of definitive treatment will be briefly covered further in Section 3.6 which describes the quality standards of urgent dental care.

3.6 Quality standards of urgent dental care

No explicit quality standards of urgent dental care have been published although guidelines exist regarding urgent dental care, antimicrobial stewardship and contractual obligations to provide appropriate care (4, 5, 52). Earlier in section 3.1.2, the SDCEP guidance on emergency dental care and on the management of acute dental problems was briefly described.

3.6.1 Clinical indicators of quality

Several aspects of quality of urgent care have been highlighted in the literature. These include clinical indicators such as:

- inappropriate use of antimicrobials
- failure rate of treatment and re-attendance of patients
- time interval between dental injury and treatment
- adequacy of protection of exposed dentine for dental trauma
- failure to document clinical diagnosis or treatment options

The inappropriate use of antimicrobials has been found in some urgent dental services (52, 53). Tulip and Palmer found the commonest treatment provided by an urgent dental service in Merseyside in 2006 was the issuing of prescriptions for antibiotics. Over half of the patients received antibiotics alone with no definitive treatment provided (52). Overall, Tulip and Palmer found 68% of patients received treatment that was considered appropriate when compared to clinical guidelines. Concerns were raised about the number of cases where no diagnosis was made (35%) or where treatment options were not documented (52).

Shahid and Godber in 2013 found that re-designing the urgent dental service to increase the provision of definitive care reduced the prescribing of antibiotics from 60% to 10%, reduced the number of people re-accessing the service for the same complaint or having to go to their own dentist (54).

A study in Australia found 10% of patients re-attended within 14 days in 2006 and 12% in 2010 (8).

Initial management of paediatric dento-alveolar trauma is important for long term patient outcomes. A survey across 3 sites in the north of England found 39% of children with dento-alveolar trauma received inappropriate treatment (49). A study of the management of paediatric dento-alveolar trauma in hospital emergency departments in the US (55) concluded that a dental setting, rather than A&E, was the most appropriate as very little medical intervention was necessary. Patient management was time consuming, expensive and may not have been definitive (55).

3.6.2 Patient-related aspects of quality

Patient-related aspects of quality have also been described, including patient satisfaction and re-attendance due to persistence of symptoms.

A scoping review of the literature on urgent dental care found little research on patient outcomes following urgent dental care and none determining potential relationships between service models and patient outcomes. Most of the literature focused on assessment of patient satisfaction (1) which was generally good. The study by Anderson and colleagues of patient outcomes of out-of-hours service in South Wales (39) has already been described in section 3.4.

3.6.3 Medico-legal considerations of urgent care

An opinion piece described the medico-legal consideration of urgent dental care (46), which included:

- good communication between triage service and clinical service

- provision of appropriate patient information, including treatment costs
- use of suitably qualified and indemnified nursing staff who are familiar with the surgery available
- well maintained and comprehensive equipment and materials
- staff trained in medical emergencies with emergency drugs kit
- legislative requirements such as clinical records
- gaining informed consent when diagnosis and treatment are carried out at the same appointment (46)

3.6.4 Summary

In summary, no explicit quality standards for urgent dental care have been produced although features of a quality service have been described in the literature from the perspectives of clinical, patient and medico-legal considerations. Little has been written about contract monitoring requirements.

3.7 The interface of urgent dental care services with other health services

It has been stated that adequate urgent dental services needs to be integrated with the wider urgent and emergency care strategy, rather than done in isolation (41). Urgent dental care services have been said to interface with other services including pharmacy, general medical practitioners, social care providers, A&E departments and GP out of hours services. However, no studies have looked at how providing urgent dental care mitigates the use of other medical services (1) or how integration can be best achieved.

While there has been a paucity of literature about many areas of urgent dental care there has been a considerable literature on the use of A&E for urgent dental care, principally conducted in the UK and the US.

3.7.1 Use of A&E departments for dental problems

A recent study found one in every 140 visits to a hospital A&E in the UK was for dental problems (56). The authors highlighted the average cost of an A&E visit is £132 with no charge to the patient. This compares to £25.61 for an emergency visit to a dentist where the patient typically pays £19.70 (56). A study in Sheffield of visits to the children's hospital A&E for dental reasons found the number of children attending for dental reasons increased over the 2003-2013 period (57).

This study found around 1.3% of visits to the A&E in Sheffield were for dental reasons. The majority of these children were under 4 years, with increases in this young age group seen over time and a disproportionately high representation from non-white children. Over two-thirds of patients attending for dental reasons were given advice only. This finding may be because either the presenting complaint was of insufficient

concern to warrant any intervention or the A&E team lacked the resource or ability to manage the dental condition. This study estimated, based on the national tariff, the average cost to the NHS of each visit to A&E was £54 resulting in a total 'dental' cost in 2012-13 in Sheffield of £37,098 (57).

An audit of oral and maxillofacial surgery units conducted across the UK (58) developed a profile of patients presenting with severe cervico-facial infections over 2 months in 2006. Just over half of patients (56%) reported being registered with a GPC and 66% had been given antibiotics only. The financial implications of these emergencies derived from the finding that 50% of these patients presented at A&E with the majority (81%) requiring hospital admission, 75% received intra-venous antibiotics, and 46% required a surgical procedure under general anaesthesia (58).

Several studies, conducted in the US, have examined the profile and attendance patterns of patients who visit A&E for dental problems. Overall, an estimated 1-3% of all A&E attendances in the US were found to involve patients with a diagnosis of a dental condition (59) (60) (61). Related costs were estimated at about \$760 per visit (at 2010 rates) and, during 2008-2010, these amounted to an expenditure of around \$2.7 billion across the US (62, 63) with A&E found to be an expensive way of providing routine dental care (64).

One of the implications of attending A&E for a dental problem is the lack of definitive treatment provision with care often limited to the prescription of analgesia or antibiotics (37). Inequalities of care are further compounded by the need for patients to then find a dentist and pay for definitive treatment (15). A lack of satisfaction about aspects of A&E care, such as long waiting times and the temporary nature of the care received, has been voiced by ethnic minority and low income groups (65). Inappropriate use of the limited resources of A&E has wider implications for capacity and quality of care offered to other patients (62, 63).

Several studies in the US have looked at how either introducing routine dental access schemes (66), changing dental insurance coverage (67, 68) or providing dental clinics in hospitals (37) can influence demand on A&E. One study in the US described how the provision of a dental clinic in a hospital reduced the demand on A&E for urgent dental care by approximately 50% and the number of patients with 2 or more visits to A&E also declined (37). Conversely, policy changes about public dental insurance coverage have been suggested to result in increased use of A&E for dental reasons (68).

It has been suggested that approaches to reduce visits to A&E for dental problems require a multilevel intervention tackling patient, community, dental provider and health system factors (69). There is little research on how urgent dental services might mitigate the use of other health services, such as general medical services or A&E services (1).

4. Conclusions and limitations

This rapid review of the literature has yielded over 200 sources and has reviewed definitions, provided details of the socio-demographic characteristics of patients, described the methods of assessing current service provision, summarised the literature on the patient journey, reviewed the different aspects of the models of care, synthesised the varying elements of quality of urgent care and searched for literature on the interface between urgent dental care services with other health services.

However, the review has a number of limitations due to the methodological approaches taken to ensure rapidity and to serve the purpose of the review.

To ensure the review was completed in time to inform the development of the commissioning standard a number of decisions were taken about the most appropriate methods to choose for the rapid review. First, the literature search was limited to literature published from 1997 onwards. Second, screening and data extraction was completed by one reviewer only. Third, no assessment of quality was included and fourth the results were presented as a narrative summary only. These methods are characteristic of rapid reviews and comparison of the results of rapid reviews and systematic reviews has found high levels of congruence (70).

In addition, the review was conducted without strict inclusion criteria, rather the objectives of the review were used to decide which literature was included. This decision was taken to ensure the review was comprehensive and that all areas covered by the commissioning standard were included.

Nevertheless, the review has provided evidence to inform the transformation of urgent dental care in England and identified research gaps. These gaps include a need to evaluate which of the different service delivery models provide optimal access, effective care and best patient outcomes in future.

The results of this rapid review of the literature on urgent dental care have been used during the development of the commissioning standard for urgent dental care services. The results were presented to stakeholders during an engagement workshop and were used to identify areas for stakeholder discussion. In addition the results have informed the commissioning standard in terms of defining what is an urgent dental problem, who might be likely to need urgent dental care and appropriate quality indicators for urgent dental care services.

Appendix 1: Search strategies

Ovid MEDLINE(R) Epub Ahead of Print, In-Process & Other Non-Indexed Citations,
Ovid MEDLINE(R) Daily, Ovid MEDLINE and Versions(R)

#	Searches	Results
1	exp Dental Health Services/	36,159
2	General Practice, Dental/	4,660
3	"dental care".tw.	10,830
4	"dental health care".tw.	902
5	"dental service*".tw.	4,726
6	"dental health service*".tw.	501
7	1 or 2 or 3 or 4 or 5 or 6	47,059
8	Emergency Medical Services/	39,453
9	(emergency adj2 (care or service* or treatment)).tw.	31,782
10	(urgent adj2 (care or service* or treatment)).tw.	3,277
11	(unscheduled adj2 (care or service* or treatment)).tw.	270
12	((("out of hours" or "out-of-hours") adj2 (care or service* or treatment)).tw.	684
13	exp After-Hours Care/	1,602
14	((("after-hours" or "after hours") adj2 (care or service* or treatment)).tw.	263
15	8 or 9 or 10 or 11 or 12 or 13 or 14	66,873
16	7 and 15	710
17	exp "Delivery of Health Care"/	992,970
18	Practice Patterns, Physicians'/	54,452
19	exp Health Planning/	330,409
20	"Health Services Needs and Demand"/	51,583
21	"patient need*".tw.	5,061
22	(needs adj2 (met or meet or meeting)).tw.	15,090
23	effective*.tw.	1,697,331
24	(patient adj2 (satisfaction or satisfied)).tw.	31,498
25	(evaluation or evaluate).tw.	1,924,754
26	(model* adj2 (service or care or delivery)).tw.	17,611
27	("quality of life" or QoL).tw.	232,382
28	17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25 or 26 or 27	4,433,583
29	16 and 28	396
30	limit 29 to yr="1997 -Current"	317
31	limit 29 to yr="2007 -Current"	198

Embase 1996 to 2017 Week 40

#	Searches	Results
1	exp dental procedure/	94,658
2	"dental care".tw.	6,728
3	"dental health care".tw.	507
4	"dental service*".tw.	2,638
5	"dental health service*".tw.	228
6	1 or 2 or 3 or 4 or 5	99,991
7	exp emergency health service/	68,584
8	emergency care/	35,097
9	out-of-hours care/	185
10	(emergency adj2 (care or service* or treatment)).tw.	32,361
11	(urgent adj2 (care or service* or treatment)).tw.	4,189
12	(unscheduled adj2 (care or service* or treatment)).tw.	349
13	((("out of hours" or "out-of-hours") adj2 (care or service* or treatment)).tw.	820
14	((("after-hours" or "after hours") adj2 (care or service* or treatment)).tw.	257
15	7 or 8 or 9 or 10 or 11 or 12 or 13 or 14	118,326
16	6 and 15	644
17	exp health care delivery/	2,301,010
18	health care planning/	65,260
19	health care need/	22,623
20	"patient need".tw.	727
21	(needs adj2 (met or meet or meeting)).tw.	15,180
22	effective*.tw.	1,753,402
23	(patient adj2 (satisfaction or satisfied)).tw.	39,551
24	(evaluation or evaluate).tw.	2,152,226
25	(model* adj1 (service or care or delivery)).tw.	10,937
26	("quality of life" or QoL).tw.	323,031
27	17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25 or 26	5,488,724
28	16 and 27	380
29	limit 28 to yr="1997 -Current"	374
30	limit 28 to yr="2007 -Current"	295

HMIC Health Management Information Consortium 1979 to July 2017

#	Searches	Results
1	dental care/	399
2	exp dental services/	1,404
3	"dental care".ti. or "dental care".ab.	430
4	"dental health care".ti. or "dental health care".ab.	22
5	"dental service*".ti. or "dental service*".ab.	756
6	"dental health service*".ti. or "dental health service*".ab.	31
7	1 or 2 or 3 or 4 or 5 or 6	2,038
8	emergency treatment/	412
9	exp emergency health services/	3,148
10	urgent care/	37
11	urgent treatment/	128
12	"out of hours health services"/	919
13	(emergency adj2 (care or service* or treatment)).ti. or (emergency adj2 (care or service* or treatment)).ab.	1,748
14	(urgent adj2 (care or service* or treatment)).ti. or (urgent adj2 (care or service* or treatment)).ab.	278
15	(unscheduled adj2 (care or service* or treatment)).ti. or (unscheduled adj2 (care or service* or treatment)).ab.	49
16	((("out of hours" or "out-of-hours") adj2 (care or service* or treatment)).ti. or ((("out of hours" or "out-of-hours") adj2 (care or service* or treatment)).ab.	629
17	8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16	5,549
18	7 and 17	54
19	limit 18 to yr="1997 -Current"	21

Health Business Elite

(exp "DENTAL CARE"/ OR ("dental care").ti,ab OR ("dental health care").ti,ab OR ("dental service*").ti,ab OR ("dental health service*").ti,ab) AND (exp "EMERGENCY MEDICAL SERVICES"/ OR (emergency ADJ2 (care OR service* OR treatment)).ti,ab OR (urgent ADJ2 (care OR service* OR treatment)).ti,ab OR (unscheduled ADJ2 (care OR service* OR treatment)).ti,ab OR ((("out of hours" OR "out-of-hours") ADJ2 (care OR service* OR treatment)).ti,ab OR ((("after-hours" OR "after hours") ADJ2 (care OR service* OR treatment)).ti,ab)

NICE Evidence

(dental care" or "dental service") AND (emergency or urgent or unscheduled or "out of hours" or "after hours")

Limit to: Guidance, Secondary evidence, Primary evidence, Practice based information
83 results

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