Each day, dental care professionals make decisions about clinical care. It is important that these decisions incorporate the best available scientific evidence to maximize the potential for successful patient care outcomes. It is also important for readers of this book to have the background and skills necessary to evaluate information they read and hear about. These evaluative skills are as important as learning facts and clinical procedures.

The ability to find, discriminate, evaluate, and use information is the most important skill that can be learned as a professional and lifelong learner. Becoming excellent at this skill will provide a rewarding and fulfilling professional career.

Background and Definition

Using evidence from the medical literature to answer questions, direct clinical action, and guide practice was pioneered at McMaster University, Ontario, Canada, in the 1980s. As clinical research and the publication of findings increased, so did the need to use the medical literature to guide practice. The traditional clinical problem-solving model based on individual experience or the use of information gained by consulting authorities (colleagues or textbooks) gave way to a new methodology for practice and restructured the way in which more effective clinical problem solving should be conducted. This new methodology was termed evidence-based medicine (EBM).

The use of evidence to help guide clinical decisions is not new. However, the following aspects of EBM are new:

- The methods of generating high-quality evidence, such as randomized controlled trials (RCTs) and other well-designed methods
- The statistical tools for synthesizing and analyzing the evidence (systematic reviews [SRs] and meta-analysis [MA])
- The ways for accessing the evidence (electronic databases) and applying it (evidence-based decision making [EBDM] and practice guidelines)

These changes have evolved along with the understanding of what constitutes the evidence and how to minimize sources of bias, quantify the magnitude of benefits and risks, and incorporate patient values. “In other words, evidence-based practice is not just a new term for an old concept and as a result of advances, practitioners need (1) more efficient and effective online searching skills to find relevant evidence and (2) critical appraisal skills to rapidly evaluate and sort out what is valid and useful and what is not.”

EBDM is the formalized process and structure for learning and using the skills for identifying, searching for, and interpreting the results of the best scientific evidence, which is considered in conjunction with the clinician’s experience and judgment, the patient’s preferences and values, and the clinical and patient circumstances when making patient care decisions. Translating the EBDM process into action is based on the abilities and skills identified in Box 1.1.

KEY DEFINITIONS

Evidence: Evidence is considered the synthesis of all valid research that answers a specific question and that, in most cases, distinguishes it from a single research study.

Evidence-based medicine: The integration of the best research evidence with our clinical expertise and our patient’s unique values and circumstances.

Evidence-based dentistry: An approach to oral health care that requires the judicious integration of systematic assessments of clinically relevant scientific evidence, relating to the patient’s oral and medical condition and history, with the dentist’s clinical expertise and the patient’s treatment needs and preferences.

Principles of Evidence-Based Decision Making

The use of current best evidence does not replace clinical expertise or input from the patient, but rather provides another dimension to the decision-making process, which is also placed in context with the patient’s clinical circumstances (Fig. 1.1). It is this decision-making process that we refer to as “evidence-based decision making” and is not unique to medicine or any specific health discipline; it represents a concise way of referring to the application of evidence to clinical decision making.
Abstract
Informing decisions with the best available evidence brings clinical research findings to the realities of practice. Clinicians who learn and practice evidence-based methodology will be able to find, efficiently filter, interpret, and apply research findings to improve patient care.

Key Words
levels of evidence
internal validity
external validity
generalizability
randomized clinical trial (RCT)
primary evidence
secondary evidence
clinical practice guidelines (CPGs)
systematic reviews (SRs)
meta-analyses (MAs)
evidence-based decision making (EBDM)
EBDM focuses on solving clinical problems and involves two fundamental principles, as follows:

1. **Evidence alone is never sufficient to make a clinical decision.**
2. **Hierarchies of quality and applicability of evidence exist to guide clinical decision making.**

EBDM is a structured process that incorporates a formal set of rules for interpreting the results of clinical research and places a lower value on authority or custom. In contrast to EBDM, traditional decision making relies more on intuition, unsystematic clinical experience, and pathophysiologic rationale.

**Evidence-Based Dentistry**

Since the 1990s, the evidence-based movement has continued to advance and is widely accepted among the health care professions, with some refining the definition to make it more specific to their area of health care. The American Dental Association (ADA) has defined evidence-based dentistry (EBD) as “an approach to oral health care that requires the judicious integration of systematic assessments of clinically relevant scientific evidence, relating to the patient’s oral and medical condition and history, with the dentist’s clinical expertise and the patient’s treatment needs and preferences.” They also have established the ADA Center for Evidence-Based Dentistry (ebsd.ada.org) to facilitate the integration of EBD into clinical practice.

The ADA’s definition is now incorporated in the Accreditation Standards for Dental Education Programs. Dental schools are expected to develop specific core competencies that focus on the need for graduates to become critical thinkers, problem solvers, and consumers of current research findings to enable them to become lifelong learners. The accreditation standards require learning EBDM skills so that graduates are competent in being able to find, evaluate, and incorporate current evidence into their decision making.

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**Box 1.1** Skills and Abilities Needed to Apply an Evidence-Based Decision-Making Process

1. Convert information needs and problems into clinical questions so that they can be answered.
2. Conduct a computerized search with maximum efficiency for finding the best external evidence with which to answer the question.
3. Critically appraise the evidence for its validity and usefulness (clinical applicability).
4. Apply the results of the appraisal, or evidence, in clinical practice.
5. Evaluate the process and your performance.

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**Fig. 1.1** Evidence-based decision making. (Copyright Jane L. Forrest, reprinted with permission.)

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**Evidence-Based Decision-Making Process and Skills**

The growth of evidence-based practice has been made possible through the development of online scientific databases such as MEDLINE (PubMed) and Internet-based software, along with the use of computers and mobile devices, for example, smart phones, that enable users to quickly access relevant clinical evidence from almost anywhere. This combination of technology and good evidence allows health care professionals to apply the benefits from clinical research to patient care. EBDM recognizes that clinicians can never be completely current with all conditions, medications, materials, or available products, and it provides a mechanism for assimilating current research findings into everyday practice to answer questions and to stay current with innovations in dentistry. Translating the EBDM process into action is based on the abilities and skills identified in **Box 1.1**.

This is illustrated clearly in a real patient case scenario (management of a patient with trauma-related avulsion and luxation of teeth) that is introduced in **Case Scenario 1.1** (Figs. 1.2 and 1.3) and used throughout the chapter.

**Asking Good Questions: The PICO Process**

Converting information needs and problems into clinical questions is a difficult skill to learn, but it is fundamental to evidence-based practice. The EBDM process almost always begins with a patient question or problem. A “well-built” question should include four parts that identify the patient problem or population (P), intervention (I), comparison group (C) and outcomes (O)—and then combining them will facilitate a thorough and precise evidence search.

**KEY FACT**

**PICO**

The first step in evidence-based decision making is asking the right question. The key is to frame a question that is simple and at the same time highly specific to the clinical scenario. Dissecting the question you want to ask into its components—problem or population (P), intervention (I), comparison group (C) and outcomes (O)—and then combining them will facilitate a thorough and precise evidence search.

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**Case Scenario 1.1** Two separate PICO questions were written as follows:

1. **For a patient with replanted avulsed and luxated teeth (P), will early pulp extirpation (10 to 14 days) (I) as compared with late pulp extirpation (past 14 days) (C) increase the likelihood of successful tooth integration and functional periodontal healing and decrease the likelihood of resorption and ankylosis (O)?**

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2. For a patient with replanted avulsed and luxated teeth (P), will short-term splinting (7 to 14 days) (I) as compared with long-term splinting (2 to 4 weeks) (C) increase the likelihood of successful tooth integration and functional periodontal healing and decrease the development of resorption and ankylosis (O)?

PICO directs the clinician to identify clearly the problem, the results, and the outcomes related to the specific care provided to that patient. This, in turn, helps identify the search terms that should be used to conduct an efficient search. It also allows identification of the type of evidence and information required to solve the problem, as well as considerations for measuring the effectiveness of the intervention and the application of the EBDM process. Thus EBDM supports continuous quality improvements through measuring outcomes of care and self-reflection.

Before conducting a computerized search, it is important to have an understanding of the types of research study methodologies and the appropriate methodology that relates to different types of clinical questions. The methodology, in turn, relates to the levels of evidence. Table 1.1 shows these relationships.

**Becoming a Competent Consumer of the Evidence**

Evidence typically comes from studies related to questions about treatment and prevention, diagnosis, etiology and harm, and prognosis of disease, as well as from questions about the quality and economics
CASE SCENARIO 1.1  

**CLINICAL APPLICATION OF EVIDENCE-BASED DECISION MAKING**

The clinician received a call from the parents of a 13-year-old female patient who had been struck in the face with a softball. She was being examined by paramedics in a town 30 minutes north of the dental office. The paramedics cleared the patient of any head or neck injury and other medical issues and informed the dentist that dental trauma was her primary injury. The dentist and his assistant met the parents and the patient at the office 45 minutes following the dental trauma. The patient’s teeth remained in her mouth following the incident. Fig. 1.2A shows the initial examination of the patient. The preference of the patient and her parents was to “do anything to keep the teeth.” After the site was cleaned and irrigated, it was apparent that there was complete avulsion of the maxillary right central incisor from the socket and lateral luxation of the maxillary left central and lateral incisors. In addition, there was alveolar bone fracture partially encasing the roots of the maxillary left central and lateral incisors. (Fig. 1.2B.) The clinician replanted the teeth and reapproximated the gingival tissue with sutures (Fig. 1.2C). A stable and accurate ribbon and flowable composite splint were placed (Fig. 1.2D), and a radiograph was taken (Fig. 1.2E).

The radiograph shows reimplantation of maxillary central incisors and left lateral incisor in correct socket location and confirmed proper reapproximation of the alveolar bone that was fractured with maxillary left central and lateral incisors. The stent also is apparent in this radiograph showing the splinting of the displaced teeth.

Due to the difficulty of splint placement and not wanting to risk displacing the teeth or breaking the splint prematurely, the clinician was hesitant to proceed with endodontic treatment until he had access to dependable information. The dentist had two questions regarding the treatment of the patient. He needed to determine the optimal timing of the pulp extirpation and splinting that would result in the best outcome and prognosis for healing. Fig. 1.3 diagrams the decision-making pathway from telephone call to resolution.24

**RADIOGRAPHIC EXAMINATION**

The radiograph shows reimplantation of maxillary central incisors and left lateral incisor in correct socket location and confirmed proper reapproximation of the alveolar bone that was fractured with maxillary left central and lateral incisors. The stent also is apparent in this radiograph showing the splinting of the displaced teeth.

**PICO QUESTION**

For a patient with replanted avulsed and luxated teeth, will early pulp extirpation (10–14 days) as compared with late pulp extirpation (past 14 days) increase the likelihood of successful tooth integration and functional periodontal healing, and decrease the likelihood of resorption and ankylosis?

Search for answers to the question on PubMed, DARE, National Guidelines Clearinghouse, ADA

Access full-text for relevant articles

Critically appraise research or find critical summary of article

Incorporate findings into practice

Patient at 4 day check  
Perform pulp extirpation on day 14  
Remove splint at 4 weeks  
See patient at 12-week check

**PICO QUESTION**

For a patient with replanted avulsed and luxated teeth, will short-term splinting (7–14 days) as compared with long-term splinting (2–4 weeks) increase the likelihood of successful tooth integration and functional periodontal healing, and decrease the development of resorption and ankylosis?

Search for answers to the question on PubMed, DARE, National Guidelines Clearinghouse, ADA

Access full-text for relevant articles

Critically appraise research or find critical summary of article

Fig. 1.3 Decision-making pathway from telephone call to resolution. ADA, American Dental Association; DARE, Database of Abstracts of Review of Effectiveness; PICO, patient problem or population, intervention, comparison, and outcome(s). (Copyright Greg W. Miller, DDS, reprinted with permission.)
of care. Evidence is considered the synthesis of all valid research that answers a specific question and that, in most cases, distinguishes it from a single research study. Once synthesized, evidence can help inform decisions about whether a method of diagnosis or a treatment is effective relative to other methods of diagnoses or to other treatments and under what circumstances. The challenge in using EBDM arises when only one research study is available on a particular topic. In these cases, individuals should be cautious in relying on the study because it can be contradicted by another study and it may test only efficacy and not effectiveness. This underscores the importance of staying current with the scientific literature because the body of evidence evolves over time as more research is conducted. Another challenge in using EBDM occurs when the limited research available is weak in quality or poorly conducted. In these cases, one may rely more heavily on clinical experience and patients’ preferences and values than the scientific evidence (see Fig. 1.1).

**Sources of Evidence**

The two types of evidence-based sources are primary and secondary, as follows:

- **Primary sources** are original research studies and publications that have not been filtered or synthesized, such as an RCT or a cohort study.
- **Secondary sources** are synthesized studies and publications of the already conducted primary research. These include clinical practice guidelines (CPGs), SRs, MAs, and evidence-based article reviews and protocols. This terminology is often confusing to individuals new to the EBDM approach because, although SRs are secondary sources of evidence, they are considered a higher level of evidence than a primary source, such as an individual RCT.

Both primary and secondary sources can be found by conducting a search using such biomedical databases as MEDLINE (accessed through PubMed), EMBASE, and Database of Abstracts of Review of Effectiveness (DARE). Other sources of secondary evidence, such as CPGs, clinical recommendations, parameters of care, position papers, academy statements, and critical summaries related to dental practice can be found on the websites of professional organizations and journals as listed in Table 1.2.

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**TABLE 1.2** Sources of Secondary Evidence

<table>
<thead>
<tr>
<th>Sources</th>
<th>Websites</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Academy of Periodontology (AAP): Clinical and scientific papers</td>
<td><a href="https://www.perio.org/resources-products/clinical-scientific-papers.html">https://www.perio.org/resources-products/clinical-scientific-papers.html</a></td>
</tr>
<tr>
<td>American Dental Association (ADA), Center for Evidence-Based Dentistry</td>
<td><a href="http://ebd.ada.org">http://ebd.ada.org</a></td>
</tr>
<tr>
<td>American Heart Association (AHA): Prevention of bacterial endocarditis, recommendations</td>
<td><a href="http://circ.ahajournals.org/content/116/15/1736.full.pdf+html?sid=ada268bd-11f10-4496-bae4-b91806aa9f41">http://circ.ahajournals.org/content/116/15/1736.full.pdf+html?sid=ada268bd-11f10-4496-bae4-b91806aa9f41</a></td>
</tr>
<tr>
<td>Cochrane Collaboration: A nonprofit organization dedicated to producing systematic reviews as a reliable and relevant source of evidence about the effects of health care for making informed decisions.</td>
<td><a href="http://www.cochrane.org">http://www.cochrane.org</a> Cochrane Oral Health Group: <a href="http://ohg.cochrane.org">http://ohg.cochrane.org</a></td>
</tr>
<tr>
<td>Journal: Evidence-Based Dentistry</td>
<td><a href="http://www.nature.com/ebd/index.html">http://www.nature.com/ebd/index.html</a></td>
</tr>
<tr>
<td>Journal: Journal of Evidence-Based Dental Practice</td>
<td><a href="http://www.jebdp.com">http://www.jebdp.com</a></td>
</tr>
</tbody>
</table>
Levels of Evidence

As previously mentioned, one principle of EBDM is that hierarchies of evidence exist to guide decision making. At the top of the hierarchy for therapy are CPGs (Fig. 1.4). These are systematically developed statements to assist clinicians and patients about appropriate health care for specific clinical circumstances. CPGs should be based on the best available scientific evidence typically from MAs and SRs, which put together all that is known about a topic in an objective manner. The level and quality of the evidence are then analyzed by a panel of experts who formulate the CPGs. Thus, guidelines are intended to translate the research into practical application.

Guidelines also will change over time as the evidence evolves, thereby underscoring the importance of keeping current with the scientific literature. One example of this is the change in the American Heart Association guidelines for the prevention of infective endocarditis related to the need for premedication before dental and dental hygiene procedures. Before the 2007 guidelines, the last update was in 1997, and before then, eight updates were added to the primary regimens for dental procedures since the original guideline was first published in 1955. In the 2007 update, the rationale for revising the 1997 document was provided, notably that the prior guidelines were largely based on expert opinion and a few case-controlled studies. With more research conducted, the ability now existed to synthesize those findings to provide a more objective body of evidence on which to base recommendations.

If a CPG does not exist, other sources of preappraised evidence (critical summaries, critically appraised topics [CATs], SRs, MAs, or reviews of individual research studies) are available to help stay current. MAs and SRs have strict protocols to reduce bias and the synthesis of research from more than one study. These reviews provide a summary of multiple research studies that have investigated the same specific question. SRs use explicit criteria for retrieval, assessment, and synthesis of evidence from individual RCTs and other well-controlled methods. SRs facilitate decision making by providing a clear summary of the current state of the existing evidence on a specific topic, SRs provide a way of managing large quantities of information, thus making it easier to keep current with new research. MA is a statistical process used when the data from the individual studies in the SR can be combined into one analysis. When data from these studies are pooled, the sample size and power usually increase. As a result, the combined effect can increase the precision of estimates of treatment effects and exposure risks.

SRs and MAs are followed respectively by individual RCT studies, cohort studies, case–control studies, and then studies not involving human subjects. In the absence of scientific evidence, the consensus opinion of experts in appropriate fields of research and clinical practice is used (see Fig. 1.4). This hierarchy of evidence is based on the concept of causation and the need to control bias. Although each level may contribute to the total body of knowledge, “not all levels are equally useful for making patient care decisions.” In progressing up the pyramid, the number of studies and, correspondingly, the amount of available literature decrease, while at the same time their relevance to answering clinical questions increases.

Evidence is judged on its rigor of methodology, and the level of evidence is directly related to the type of question asked, such as those derived from issues of therapy or prevention, diagnosis, etiology, and prognosis (see Table 1.1). For example, the highest level of evidence associated with questions about therapy or prevention is from CPGs based on MAs and/or SRs of RCT studies. However, the highest level of evidence associated with questions about prognosis is from CPGs based on MAs and/or SRs of inception cohort studies. Because the two case scenario questions are related to prognosis, the highest level of evidence for them is a CPG based on MAs and/or SRs or of inception cohort studies. If no CPG is found, then the next highest level would be a critical summary of an MA or SR of cohort studies. In the event that a critical summary is not found, MAs or SRs of cohort studies followed by individual cohort studies provide the next highest levels of evidence.

Knowing what constitutes the highest levels of evidence and knowing how to apply evidence-based filters are necessary skills to search the literature with maximum efficiency. By using filters, one can refine the search to limit the citations to publication types such as practice guidelines, MAs, SRs, RCTs, and clinical trials, the highest levels of evidence.
Searching for and Acquiring the Evidence

PubMed is designed to provide access to both primary and secondary research from the biomedical literature. PubMed provides free access to MEDLINE, the National Library of Medicine’s premier bibliographic database covering the fields of medicine, nursing, dentistry, veterinary medicine, the health care system, and the preclinical sciences. MEDLINE contains bibliographic citations and author abstracts from more than 5200 biomedical journals published in the United States and 80 other countries. The database contains more than 22 million citations dating back to 1966, and it adds more than 520,000 new citations each year.1

It is often helpful to identify the appropriate terminology when searching PubMed. This is done by using the Medical Subject Heading (MeSH) database. It provides the definition of terms and illustrates how the terms are indexed in MEDLINE. The PICO terms from the question can be typed into the MeSH database to maximize searching efficiency. For example, by typing “avulsed tooth” into the MeSH database, a term from the case scenario, it is learned that the MeSH term is “tooth avulsion.” It is defined as partial or complete displacement of a tooth from its alveolar support. It is commonly the result of trauma. It also is learned that “tooth luxation” links to the MeSH term “tooth avulsion.” This informs the searcher that “tooth avulsion” is the best term to use for the search because it encompasses both avulsed and luxated teeth.2

Using PubMed’s Clinical Queries feature, one can quickly pinpoint a set of citations that will potentially provide an answer to the question being posed. Although online databases provide quicker access to the literature, knowing how databases filter information and having an understanding of how to use search terms and database features allow a more efficient search to be conducted.

Because two focused clinical (PICO) questions were generated from the clinical case, two separate searches were conducted, one for each PICO question. In addition to PubMed, several other databases were used to find high levels of evidence. These included the Database of Abstracts of Reviews of Effects (https://www.crd.york.ac.uk/CRDWeb/), the National Guideline Clearinghouse (http://www.guideline.gov), the ADA Center for Evidence-Based Dentistry website (http://cbsd.ada.org), the American Academy of Pediatric Dentistry website (www.aapd.org), and the American Association of Endodontists (www.aae.org), resulting in several relevant references.

When searching for evidence, the PICO question guides the search4,6 (Table 1.3). By using key terms identified in the PICO question and combining them using the Boolean operators “OR” and “AND,” relevant articles can be narrowed to a manageable number.

The first search used the terms “(tooth avulsion OR tooth replantation) AND (pulp extirpation OR root canal therapy).” This resulted in 590 papers. Studies were limited to practice guidelines, MAs, and SRs by using each of these three filters separately so that each of these types of studies could be identified. The findings included four practice guidelines including those of the American Association of Endodontists and the International Association of Dental Traumatology, one critical summary of an SR, and one SR. The second search used the terms “(tooth avulsion OR tooth replantation) AND splints.” This resulted in 340 papers. Again, studies were limited to practice guidelines, MAs, and SRs by using the filter for each publication type separately. Relevant results included four practice guidelines from the International Association of Dental Traumatology and Pediatric Dentistry, one MA, and one SR. Fig. 1.3 provides a detailed review of the decision-making steps in this case and the outcomes.24

The articles that were selected as relevant research included each aspect of the PICO question. Inclusion criteria included the following: The patient population studied had to have replanted avulsed or luxated teeth; the research studied the intervention for each of the two PICO questions, pulp extirpation and splint duration, respectively; and the research measured at least one of the outcomes of tooth integration, functional periodontal healing, or the levels of resorption or ankylosis. To reduce the requirement of critical appraisal, the search also looked for critical summaries of the SRs that were found.

Appraising the Evidence

After identifying the evidence gathered to answer a question, it is important to have the skills to understand the evidence found. In all cases, it is necessary to review the evidence, whether it is a CPG, MA, SR, or an original study, to determine whether the methods were conducted rigorously and appropriately. International evidence-based groups have made this easier by developing appraisal forms and checklists that guide the user through a structured series of “YES/NO” questions to determine the validity of the individual study or SR. Table 1.4 provides the names and websites of three different guides that can be used for critical analysis.
Common Ways Used to Report Results

Once the results are determined to be valid, the next step is to determine whether the results and potential benefits (or harms) are important. Straus and colleagues16 identified the clinically useful measures for each type of study. For example, in determining the magnitude of therapy results, we would expect articles to report the control event rate (CER), the experimental event rate (EER), the absolute and relative risk reduction (ARR or RRR), and number needed to treat (NNT). The NNT provides the number of patients (e.g., surfaces, periodontal pockets) who would need to be treated with the experimental treatment or intervention to achieve one additional patient (surfaces, periodontal pockets) who has a favorable response. Another way of assessing evidence is presented in Chapter 2, which introduces 12 tools that may be useful in assessing causality in clinical sciences.

In appraising the evidence found for the case scenario, the first research study retrieved that answered the first PICO question was a well-conducted SR published in Dental Traumatology in 2009.17 Results indicated an association between pulp extractions performed after 14 days following replantation and the development of inflammatory resorption. A corresponding critical summary also was found.20 This evidence was consistent with the 2007 clinical guidelines from the International Association of Dental Traumatology for pulp extraparation within 10 to 14 days of replantation.13

The Practice Guideline on the Management of Acute Dental Trauma from the American Academy of Pediatric Dentistry answered the second PICO question. It recommended a “flexible splint for 1 week” for avulsed teeth. However, for lateral luxation, an additional 2 to 4 weeks may be needed when there is breakdown of marginal bone.21 In addition, a well-conducted SR about splinting duration reported inconclusive evidence of an association between short-term splinting and an increased likelihood of functional periodontal healing, acceptable healing, or decreased development of replacement resorption.14 The study found no evidence to contraindicate the current guidelines and suggested that the likelihood of successful periodontal healing after replantation was unaffected by splinting duration. Although this SR excluded studies of luxated teeth, this SR is still applicable to the patient. It concluded that dentists should continue to use the currently recommended splinting periods when replanting avulsed permanent teeth, pending future research to the contrary.23 Consistent with previous reviews, another SR on splinting luxated, avulsed, and root-fractured teeth reported that “the types of splint and the fixation period are generally not significant variables when related to healing outcomes.”23

These two SRs were appraised using the Critical Appraisal Skills Program (CASP) form for appraising reviews (see Table 1.4).

Applying the Evidence: Evidence-Based Dentistry in Action

Throughout this chapter, the EBDM process has illustrated the application of evidence in clinical decision making. The clinician used the EBDM process to answer two clinical questions. Several relevant resources were incorporated into the decision-making process and the treatment of the patient. The clinician performed pulp extractions on the avulsed and luxated teeth within the recommended time period of 10 to 14 days (Fig. 1.5A). Healing at 2 weeks post trauma is seen in Fig. 1.5B. The clinician also removed the splint within the recommended time frame for luxated teeth of 2 to 4 weeks. The evidence, in combination with clinical experience, helped provide care for this patient that resulted in the best possible prognosis given the extent of the patient’s dental trauma. It also allowed the patient to keep her own teeth, which incorporated the patient preferences aspect of the EBDM process. Fig. 1.5C shows the patient at 4 weeks post trauma; Fig. 1.5D shows the patient at 12 weeks; and Fig. 1.5E shows the patient 2 years post trauma.

Evaluating the Outcomes

The final step in the EBDM process are to evaluate the effectiveness of the intervention and clinical outcomes and to determine how effectively the EBDM process was applied. For example, one question to ask in evaluating the effectiveness of the intervention is, “Did the selected intervention or treatment achieve the desired result?” In this specific case, the answer is yes.

EBDM is a valuable tool that guides practice decisions to achieve optimal results. In the case of tooth avulsion, the key PICO questions were established to identify research that studied the outcomes of reducing the risk of root resorption and tooth ankylosis and increasing periodontal healing. In using the EBDM process, providers can be confident that they have the most current and relevant evidence available on which to base treatment decisions to provide the best treatment to improve the possibility of a successful outcome.

Using an EBDM approach requires understanding new concepts and developing new skills. In addition to evaluating patient care outcomes, another aspect of evaluation is in using the EBDM process. Questions that parallel each step in the EBDM process can be asked in evaluating self-performance. For example, “How well was the search conducted to find appropriate and relevant evidence to answer the question?” As with most learning, time and practice are essential to mastering new techniques.

CHAPTER HIGHLIGHTS

- Evidence-based decision making (EBDM) provides clinicians the skills to find, efficiently filter, interpret, and apply research findings so that what is known is reflected in the care provided.
- EBDM takes time and practice to learn to use.
- When mastered, EBDM is an efficient way for clinicians to stay current, and it maximizes the potential for successful patient care outcomes.

Conclusion

An EBDM approach closes the gap between clinical research and the realities of practice by providing dental practitioners with the skills to find, efficiently filter, interpret, and apply research findings so that what is known is reflected in the care provided. This approach assists clinicians in keeping current with conditions that a patient
Evidence-Based Decision Making

Alert readers about important advances in a concise and user-friendly manner. By integrating good science with clinical judgment and patient preferences, clinicians enhance their decision-making ability and maximize the potential for successful patient care outcomes. As EBDM becomes standard practice, individuals must be knowledgeable about what constitutes the evidence and how it is reported. Understanding evidence-based methodology and distinctions among different types of articles allows the clinician to judge better the validity and relevance of reported findings. To assist practitioners with this endeavor, SRs and MAs are being conducted to answer specific clinical questions and to support the development of CPGs. Journals devoted to evidence-based practice are being published to alert readers about important advances in a concise and user-friendly manner. By integrating good science with clinical judgment and patient preferences, clinicians enhance their decision-making ability and maximize the potential for successful patient care outcomes.

Fig. 1.5 (A) Periapical radiograph following pulp extirpations. (B) Healing at 2 weeks post trauma. (C) Healing at 4 weeks post trauma. (D) Healing at 12 weeks post trauma. (E) Patient 2 years post trauma (Copyright Greg W. Miller, DDS, reprinted with permission.)

References for this chapter are found on the companion website www.expertconsult.com.
References


