Over the past 50 years, there have been tremendous advances in dental care. For years, the dental profession was concerned with the results of treating dental decay and gingival disease. Today, dentists are more proactive, and attempt to eliminate the causes of these conditions even before they arise. Increased patient education, water fluoridation, and improved home care methods are some of the more effective tools in this campaign.

Regularly scheduled recall, or recare, dental visits cannot be overstated. Dentists are able to regularly monitor the status of the patient’s oral health and evaluate ongoing home-care efforts. The recall appointment, however, occurs only twice a year; the patient is in charge of maintaining oral hygiene every day at home. It is the dentist’s responsibility to evaluate the various modalities available for home care and educate the patient in the selection and use of these methods.

Searching for effective home care
It is well-known that effective at-home oral hygiene contributes to good oral health. This philosophy is based on studies that have clearly indicated the role of microbial plaque in causing gingival disease.1,2 The American Dental Association recognizes the effectiveness of a toothbrush by its ability to reduce gingivitis.3

The microbes that inhabit the accumulated plaque in the region of the gingival crevice are particularly implicated in the development and the continuance of chronic periodontal disease.4 It is also a concern that bacterial plaque has a tendency to advance in a subgingival direction,5 promoting the presence of bacteria into areas less accessible to at-home hygiene procedures.

Fortunately, the daily removal of even supragingival plaque causes a significant decrease in subgingival bacteria.6 The relationship between bacterial plaque and dental caries was demonstrated many years ago.7,8 Numerous bacteria and their chemical end-products have been implicated in the destruction of enamel and dentin. Many bacteria are involved in the breakdown of both soft and hard tissues.

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Effective home care should disrupt plaque that forms a comfortable substrate for the bacteria causing so much tissue damage. As the plaque is eliminated, or at least regularly disturbed, the bacterial activity is diminished. The simple act of removing dental plaque with its bacterial population, serves to reduce gingival inflammation, both acute and chronic, and to reduce the incidence of dental decay. The dentist must determine the most suitable instrument(s) for achieving these objectives, and then persuade the patient to follow the selected regimen on a frequent and regular basis.

Dental health maintenance in the patient population provides a much greater awareness of dental health and oral cleanliness, but also creates frustration with traditional methods. While the practice of effective oral hygiene is acceptable to most patients, its long-term promise of benefits may make the day-to-day routine of manual brushing tedious. It is important to select proper motivating factors and proper home care modalities for each patient.

In the search for effective oral hygiene tools, the patient has several nondental objectives as well. Generally, a clean feeling is desired after brushing. This implies that not only must the plaque and the food debris be removed from the dental surfaces, but the teeth must feel polished and smooth. People prefer to spend little time with toothbrushing; therefore, any technique that will make brushing time more effective is welcome. Powered toothbrushes, with their increased cleansing motions and regulated tuft and head activity, provide more effective brushing (see Figures 1 and 2).

Manual brushing does not equally access all the areas of the mouth. Patients realize this but don’t know how to rectify it. Manual nondexterity or a lack of time or attention may be to blame. They brush and floss adequately, but require professional leadership in improving their oral hygiene results.

Making the transition to powered brushing

There are a number of studies indicating that power-assisted toothbrushing is significantly superior to manual toothbrushing in the removal of subgingival and interproximal plaque, and in the reduction of gingivitis. Thus, the majority of adequate brushers can improve the level of their oral hygiene by combining their manual efforts with a powered toothbrush. A key element involved in increasing a patient’s proficiency in plaque removal is professional oral hygiene instruction. While powered toothbrushes tend to improve home care efficacy, the inclusion of a professional training regime provides the maximum benefit.

Other factors affect the consumer’s reaction to new brushing techniques. Ease of use is very important—anything too difficult to learn or to assimilate into daily routine is not likely to be
adopted. Design and shape of a device are important to all users, but particularly to individuals who have limited or impaired manual facilities.

The novelty factor is also a good motivator. Many people like to try something new. Unfortunately, once the novelty wears off, patients must be remotivated by changes in the product or by the technique in which it is used.

The patient who feels that a brushing technique is effective is more likely to continue the process on a regular basis. High speed brushing makes the teeth feel smooth. The increased gingival stimulation provided by powered toothbrushes provides a clean feeling that creates a need in the patient's mind to repeat the procedure often.

**Indications for powered toothbrush use**

While most patients can benefit from improved home care, it is easier to identify specific at-risk individuals if specific criteria for their selection are stated.

**Poor oral hygiene:** These individuals do not exercise proper home care with existing methods. They are poor risks for sophisticated restorative procedures. Any mechanism that may help them improve their hygiene is welcome. Once they have improved their home care with a powered brush, they may be candidates for the extensive treatments that are required (see Figure 3).

Patients often perceive their oral hygiene differently than their dentist. What looks good to the patient may reveal ongoing gingival inflammation and periodontal disease to the professional.

**Extensive implant or prosthodontic treatment:** These are patients with histories of poor oral hygiene. That is why they require extensive restorative procedures. Simply placing the prosthetic devices into their mouths does not guarantee improved hygiene.

Home care education must be accompanied with tools that allow the ongoing maintenance to be easy and simple. Powered brushing should improve oral habits and make them more effective, particularly in areas which have limited access to manual brushes. It is important to advise these patients that the high level of hygiene maintained by the proper use of powered toothbrushes will protect their investment (see Figure 4).

**Recent periodontal treatment:** These patients, too, have a history of poor oral hygiene. Their old habits for home care were obviously unsuccessful and must be made more effective. To compound their maintenance problems, periodontally treated patients often have open embrasures and exposed roots. These are areas where even more home care attention than usual must be focused.

Powered toothbrushes are particularly useful for these patients. The added effectiveness of powered brushing allows them to redirect their home care and maintain optimal oral health.

**Hormone/drug induced gingivitis:** These patients may actually be practicing good oral care, but external factors predispose them to maintenance problems. Pregnancy gingivitis and dilantin hyperplasia are two examples of such conditions. Routine manual brushing may not be enough to create a normalized gingival environment, but the boost of powered brushing helps return the tissue to a healthier state.

**Orthodontics:** Approximately 75 percent of the patients undergoing orthodontic treatment are adolescents. Not only do the appliances collect extensive plaque, but the home care compliance at this age often leaves a lot to be desired. The combination of these factors causes carious damage, even as the teeth are being repositioned and aligned.

The use of a powered toothbrush assists the patient in eliminating plaque in and around the irregular form of the brackets, bands, and wires. Powered toothbrushes remove significantly more plaque than conventional brushes, and the result is less gingival inflammation and bleeding.

**Poor dexterity:** There are many patients who are unable to make the fine motor movements involved in effectively brushing teeth. Others, such as arthritics, are unable to grip the brush effectively. These people require assistance in order to properly manage their home care. The precise movements of the bristles in the powered toothbrush are designed to do the work for the patient and make the procedure easier.
There is a definite correlation between smoking and periodontal disease; the tissue is affected by irritants in the smoke, and the teeth are stained and dull. A powered toothbrush helps reduce these problems, but may not be able to overcome the side effects of smoking completely (see Figure 5).

Noncompliance: Despite the best efforts of the dental profession, some people choose not to participate in dental home care. They do not brush or floss with any regularity, but expect the dentist to restore their mouths to perfect health. Powered toothbrushes are consistently more effective than manual brushing and can serve this group well. They may even see the results similar to those of manual brushing and flossing combined.

Selecting a powered toothbrush
Patients look to dental professionals for leadership and education in the selection of a powered toothbrush. A careful analysis of the patient’s condition will determine the most appropriate toothbrush. The dentist should then prescribe the product to the patient, and monitor ongoing home care results to assess effectiveness. The responsibility of encouraging certain patients to switch to powered toothbrushing lies with the dentist and the auxiliary staff.

The selection of a powered toothbrush depends on patient preference and professional parameters. Since the initial recommendation is often made by the dentist, the primary criteria are the professional ones.

Dentists are most concerned with the design of the powered brush as it influences the cleansing effectiveness of the home care regimen. Some design factors to consider include the type of cleansing motion by the brush and the speed of this motion. The movement of the bristles should help stabilize the brush on the teeth and prevent inadvertent movement over the dental surfaces. The speed of the brush should be high enough to remove plaque and stain, yet not so high as to cause discomfort, irritation, or excessive vibration.

The cleansing motion plays a large role in overall home care compliance. The range of sensations created by brushing includes pressure, tingling, massage, and pain. A pleasant, comfortable procedure is likely to be continued; tedious, difficult, and uncomfortable home hygiene will be avoided.¹ Some sonic-powered toothbrushes are particularly ticklish or irritating on the maxillary anterior, lingual-gingival tissues.

The ergonomic design of the powered toothbrush is important. A unit that fits into the patient’s hand comfortably is more likely to find itself regularly used. The weight of the unit must be comfortable over a 2 minute span—the recommended time for toothbrushing. The appearance of the powered toothbrush (and the base recharging unit) must be attractive and stylish; esthetic appeal has a lot of influence on product acceptance.

The time it takes the patient to become familiar and comfortable with the selected powered toothbrush is an important consideration; any procedure that is difficult to learn, or takes a lot of practice, is not likely to be a hit. A short learning curve is not only desirable, it is essential.

The dentist should take into careful consideration published data on powered toothbrushes—all electric toothbrushes are not created equal. There are many published studies that compare and contrast the various powered toothbrushes available on the market.

Conclusion
It is evident in the dental literature of the past few years that powered toothbrushing can provide a significant improvement over manual toothbrushing in plaque removal and the prevention of gingivitis and dental decay. This information is not generally known to the public, and it is the dental team’s responsibility to educate and inform their patients. Dentists must also be involved in the selection of the product that best matches the patient’s hygiene needs and manual dexterity. Dentists should take a proactive role in adding the powered toothbrush to the home care armamentarium. ■

4. Slots J. Subgingival microflora and peri

Figure 5. A powered toothbrush helps reduce stains on the teeth of a smoker.
Powering toothbrushing

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Patient fear of dental treatment

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