Factoring Patient Compliance into Oral Care

A Peer-Reviewed Publication
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Educational Objectives
Upon completion of this course, the clinician will be able to do the following:
1. List and describe the factors involved in patient noncompliance.
2. List the methods that can be used to help compliance.
3. Describe the techniques and aids that can be used to assist with patient home care compliance.
4. List and describe the factors and techniques that can help improve patient compliance with treatment.

Abstract
Patient noncompliance refers to nonadherence (or only partial adherence) to health-related behaviors and is a problem for medical care and dental care alike. Noncompliance affects outcomes across all disciplines, including restorative, periodontal and orthodontic care. Noncompliance may be the result of internal factors (the “self”) or external factors. Interventions that may help address these internal and external factors include patient communication and education, behavioral modification programs, psychological help and selected therapies. While behavioral interventions are helpful in improving compliance, it is also important to remove as many obstacles to patient care as possible, with the objective of improving compliance. Enhancing home care and treatment options is helpful for patient compliance.

Introduction
Patient noncompliance refers to nonadherence (or only partial adherence) to health-related behaviors and is a problem for medical care and dental care alike. While it may seem that the risks associated with more severe and life-threatening conditions would provoke greater patient compliance, this is not necessarily borne out by studies. Furthermore, given the recent associations between oral disease and systemic diseases such as cardiovascular diseases, renal disease and diabetes, it has become increasingly important to obtain patient compliance for both medical and dental conditions. Patient noncompliance is a well-recognized problem, and it continues to be a major obstacle to appropriate care that ensures patients’ health and well-being.

Caries is a cradle-to-grave problem. In the United States, around 50% of the population experience gingivitis around at least four teeth, while severe periodontal disease affects 14% of adults aged 45 to 54 and 23% of adults between 65 and 74 years of age. While early childhood caries is experienced disproportionately by young children from underprivileged segments of the population, by adolescence caries is experienced by 42% of people. Caries is experienced by 91% of adults. Root caries is also a problem, and is experienced by 32% of people aged 60 and over.

Noncompliance affects outcomes across all disciplines, including restorative, periodontal and orthodontic care. During orthodontic treatment, decalcification is a common sequela of poor oral hygiene; it has also been associated with longer treatment duration and, in some cases, with the clinician determining that treatment should be discontinued. Noncompliance in periodontal patients results in poor periodontal treatment outcomes and an increased incidence of root caries. Noncompliance with smoking cessation recommendations places patients at increased risk for a host of medical conditions, as well as oral cancer, periodontal disease and poor periodontal therapy outcomes. Smokers are known to have more periodontal disease and poorer periodontal treatment outcomes than nonsmokers have. Given these facts, a further goal for the dental office should be providing smoking cessation advice to smokers and ensuring their compliance.

The clinician must have an understanding of the reasons for noncompliance and the appropriate interventions to address these. Prevention and treatment of oral diseases require that patients be compliant with healthcare recommendations and advice.

Table 1. Noncompliance outcomes

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<tr>
<td>Poor oral hygiene</td>
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<td>Periodontal disease</td>
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<td>Poor periodontal treatment outcomes</td>
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<td>Increased caries risk</td>
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<tr>
<td>Decalcification during orthodontic treatment</td>
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<tr>
<td>Longer duration of orthodontic treatment</td>
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<td>Smoking and increased risk of oral cancer and medical conditions</td>
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Factors in Noncompliance
Noncompliance may be the result of internal factors (the “self”) or external factors such as the community or providers. It is only by understanding this that the dental professional can be in a position to help improve an individual patient’s compliance.

Internal factors associated with noncompliance can include fear and anxiety about visiting the dentist or hygienist, fear of pain, fear of needles, lack of understanding, poor communication, apathy, perceived or real lack of time, lifestyle, age, health beliefs, perceived unimportance of treatment and/or oral care, physical and psychological health, low self-esteem, and embarrassment. It is particularly difficult to obtain compliance from adolescents, and more than 50% of the overall population has been estimated to suffer from dental anxiety.
Interventions that may help address these internal and external factors include patient communication and education, behavioral modification programs, psychological help and selected therapies, and improved home care regimens. Providing treatments that alleviate patients’ concerns about pain, needles and time, and creating home care regimens that mitigate noncompliance factors, may also remove some obstacles to care.

**Communication and Education**

One source of noncompliance is poor communication between clinicians and patients. This may be the result of infrequent or abbreviated communication; giving patients too few facts (or, conversely, too many facts) at one time; complicated information; or a poor communication style. It is essential that the dental professional provide the patient with an appropriate amount of information at an appropriate level and at the appropriate moment. For this to be effective, a good rapport is essential. The patient should be given enough information to learn and understand, but not so much that it is overwhelming. At subsequent visits, more information can be given. The amount of information a patient can absorb and apply will depend upon the individual patient. Learning and applying new information or techniques can be achieved by building on the previous set of information. Poor communication and education results in confusion and misunderstanding over treatment and care, which can result in poorer patient compliance with recommended care. 22,23

Studies have found that supplementing oral communication with written communication may be preferred by patients and may result in greater patient compliance than when only oral communication is used; when compared to written instructions, computerized instructions have been found to result in increased compliance in medical patients. 24,25 Compared to traditional methods, technology-enabled patient education has been found to offer improvements in knowledge and, in some cases, in patient compliance with treatment and home care. One study of heart failure patients found improved learning and knowledge after one session of computer-based education. Compliance did not improve, however — perhaps because there had been only one session. 26 A second study, comparing patients who receive standard patient education plus or minus video education, found greater patient compliance with self-care in the group receiving supplemental video education. 27 Using video- or computer-based educational tools may also alleviate the problem of mismatched reading levels between patients and educational materials. 28

Newitter et al. assessed the effectiveness of a computer-generated graphic presentation along with written information in educating patients on home care and the prevention of caries. The information reminded patients to perform their daily home care regimen. 29 Graphic presentation of information has also been used to educate children. One study found a “sugar clock” useful in educating children aged 9–11 years about limiting the number of times per day they consumed sugar. Using a sugar clock, children are asked to use a circle with the hours marked on it, and to enter on the clock each time they ate or drank something and when they brushed their teeth. Four months after the sugar clocks were introduced, the children were still more knowledgeable than a control group educated without using a sugar clock. The graphic presentation using a sugar clock was deemed to be an effective method to educate this age group. 30 Computer-generated reports are currently used in dentistry for risk assessments and treatment recommendations, and have proven useful in periodontal education and care in particular.

Web-based education has been found to be helpful in improving diabetic patients’ knowledge base and compliance with home care and treatment. 31 Web-based education can be extended to include individualized, internet-accessed web programs that include the patient’s disease and treatment history, home care regimen, appointments, and reminders; this is known as patient-oriented education management (POEM). 32 One can surmise that Web-based programs might also
be useful for patients receiving extensive and ongoing therapy for oral disease.

Equally important is the manner in which the message is framed and delivered. In one study, information provided in a way that frames behavior change as a “gain” was found to result in improvements in oral care (although, curiously, the same study found “gain-framed” information no more effective than “loss-framed” information for other healthcare compliance issues such as skin cancer prevention, safe sex, or diet and nutrition behaviors). Gain-framed messaging also becomes important if a patient is reluctant to undergo screening programs such as oral cancer screening. While it may be possible (although not advisable) to perform a basic oral examination for oral cancer without alerting the patient to this ahead of time, if adjunctive screening technology is being used, the patient must first agree to the procedure. This requires patient education regarding oral cancer incidence and the importance of screening and being able to communicate effectively. Gain-framing the message — pointing out that the examination may detect a lesion at an early stage — is an important component of this.

It has been found, however, that long-term behavior change is difficult to achieve through traditional methods such as patient education. It is important to differentiate noncompliance associated with communication and education problems from noncompliance due to behavioral or psychological issues.

**Behavioral Change Methodology**

A number of methods have been utilized to engage patients and encourage positive behavioral changes. Behavior modification programs and interventions by psychologists have also been proposed for patients with dental phobias that result in a failure to access dental care. Renz et al., in discussing the difficulties of achieving long-term behavior changes, determined that it might be possible to effect change through psychological approaches rather than through traditional methods. One study found improvement in home care regimens for dental care and diabetes care through the strengthening of patients’ self-esteem. This underscores the importance of ensuring that patients learn at their own pace, are not overwhelmed with “science,” and are not made to feel inadequate if their home care has not improved or if they are having difficulty learning a technique.

Self-care behavior can be influenced by concrete planning of care, with very specific directions about where, when and how to perform oral hygiene procedures. In one study involving flossing, the 239 patients who received these plans had improved interdental oral hygiene care at follow-up after a two-month period. Therefore, it is clear that discussing, communicating and agreeing upon concrete action plans related to oral hygiene can be useful. A second study, conducted among dental students, supports these findings. The students were assessed for daily compliance with flossing. It was found that specific planning and social cognition were associated with increased compliance. Social cognition involves understanding of risks, expectations about outcomes and self-perception regarding the ability to perform the desired behavior (again, in this case, flossing).

One retrospective study of periodontal patients found that in those smokers who chose to undergo periodontal therapy, good compliance levels were obtained both with periodontal treatment and home care, as well as with smoking cessation. This was achieved when a comprehensive treatment plan was mapped out that included a supportive care plan for both home care and smoking cessation. Philippot et al. educated patients about the realities of their disease — in this case, periodontal disease — and asked them to keep a daily diary of their home care and any improvements they saw. The study found that planning made patients realize that what they were doing resulted in improvements in the amount of plaque present, and it encouraged them to comply. This approach is based on the auto-regulation theory.

**Table 3. Behavioral approaches**

| Concrete planning of self-care (home care) |
| Comprehensive treatment and supportive plan |
| Social cognition |
| Auto-regulation |
| Trans-theoretical model |
| Strengthening patients’ self-esteem |

Another approach is the transtheoretical model. This is based on the concept that patients go through several phases during deliberate behavior-
al changes. These include precontemplative, contemplative, preparative, action and maintenance phases. Knowing where a patient is along this chain helps the clinician tailor education, advice and interventions to the specific individual. An example of such an intervention would be smoking cessation advice combined with oral hygiene advice. A standard practice of tobacco intervention involves use of the five A’s: ask, advise, assess, assist, and arrange follow-up. During the asking and advising stages, the clinician obtains as much information as possible from the patient about his or her tobacco habits, and advises patients on the health risks and problems associated with tobacco use, as well as on the benefits of smoking cessation (a gain-framed message). For instance, one study found that only 6% of responding patients knew of an association between smoking and periodontitis. The clinician must then assess the patient’s readiness and motivation level to engage in a smoking cessation program. If the patient is ready, he or she has moved from the contemplative phase and is preparing to take action to cease tobacco use.

While behavioral interventions are helpful in improving compliance, it is also important to remove as many obstacles to patient care as possible, with the objective of improving compliance. Enhancing home care and treatment options is helpful for patient compliance.

Compliance and Home Care

Compliance with home care is one of the greatest issues in dental care. The majority of patients are noncompliant to some degree with home oral care regimens; this includes patients who have been extensively treated for caries and/or periodontal disease. In one study of 874 patients who had been receiving periodontal maintenance therapy for 10 years, only 45.8% were found to be compliant in terms of home care. In another study, at the start of periodontal therapy, 95% of patients wanted to retain their teeth for life and to be able to brush adequately. However, over a five-year period it was found that patients who initially had poor attitudes toward maintaining oral health were more likely to abandon periodontal maintenance. Noncompliance with appropriate brushing at the gingival margin and with the appropriate use of interdental brushes and fluoride toothpaste was an independent predictor of poor overall compliance. Behavioral methods were suggested to improve compliance.

A further problem in assessing patient compliance is the disparity between self-reported compliance — which is generally already poor — and actual compliance. While reported rates of oral hygiene compliance are poor, one study data logged two-minute manual brushing compliance compared to diary entries and found that the diary entries by patients exaggerated their level of compliance, which in fact was poorer than reported (34% versus 58%). Behavioral self-analysis has been suggested to help overcome the problem of patient compliance with home care.

The intensity of a patient’s home care needs also does not reflect the degree of compliance. Compliance with home oral care regimens in head- and neck-irradiated patients has also been found to be low, despite emphasis during treatment of the necessity of careful follow-up care and the risk of sequelae (including radiation-induced rampant caries). Of dentate-irradiated patients in one study, 51% did not return within a mean of 7.5 months following irradiation. Implant patients are also noncompliant, and many return for maintenance appointments without ever having flossed at home. In recommending a home care regimen to patients, the simpler the regimen and the easier it is to perform, the better.

Home care regimens

Home oral care regimens typically include brushing and interdental cleaning. Depending on the individual patient and the caries risk factors, the regimen may also include use of fluoride (beyond that which is provided in a regular fluoride dentifrice).

Brushing and interdental cleaning

Both manual and powered brushes are known to be effective. The time and attention a patient pays to brushing and interdental cleaning influence the results; manual brushes have been found to be effective in patients paying sufficient attention to, and spending adequate time, brushing. However, many patients brush for only one minute, which will not result in thorough plaque removal. They may also neglect or have difficulties reaching less accessible areas of the mouth.

Patients are notoriously noncompliant when it comes to flossing. More than half of dental hygienists in one survey reported that less than one-third of their patients flossed daily; not one hygienist reported that all his or her patients flossed daily. This may be due to the time required or the perceived unimportance of interdental cleaning; also, as interdental plaque is not visible, it may not be socially unacceptable. Flossing may require a
more exact technique and more dexterity than do other methods of interdental cleaning. An advantage of floss is its ability to reach narrow interdental spaces; a disadvantage is that the tight contact points of floss can make its use difficult and, if care is not taken, can cause a patient to shred the floss and/or injure the gingiva. These problems can be alleviated by use of one-handed flossing aids, but this does not solve the overall compliance issue.

**Keeping it simple**

Ideal oral hygiene aids and techniques are those that make brushing and interdental cleaning more effective and easier within a given period of time. Using an electric toothbrush can help, in particular with noncompliant patients, by reducing the effort and time required to achieve compliance. In one study of orthodontic patients with gingivitis, where the patients were noncompliant but used adequate oral hygiene, using a powered toothbrush was found to result in significant improvements: a 57% reduction in supragingival plaque, compared to a 10% reduction when using manual brushes.58 A number of studies have found that using a powered brush aids plaque removal. Rotary oscillating, rotary and sonic brushes have all been found to be effective. A small study found a rotary-powered brush significantly quicker and more effective at removing visible plaque, with 75% of the plaque removed in 15 seconds, versus 30 seconds when using a manual brush.59 Other studies have also found powered brushes to be more effective than are manual brushes.60,61

Interdental oral hygiene devices include interdental brushes and cleaners, floss, and powered brushes with interdental heads. Interdental brushes offer an alternative that may be easier than flossing and has been shown to be at least as effective. A number of interdental brushes are available, including slim designs for narrower interdental spaces. Nonetheless, a second step required in addition to brushing — for noncompliant patients, this is a barrier. While brushing along with either flossing or using interdental brushes is the standard oral hygiene regimen, a one-step procedure may improve compliance in some patients. Powered brushes with interdental heads and narrow heads offer an opportunity to reach interdental spaces more effectively than do manual brushes. Murray et al. studied the use of a manual brush plus floss and toothpicks, compared to the use of only a rotary-powered brush, and found that the one-step procedure with the rotary brush was as effective as the two- or three-step procedure in controlling gingivitis and reducing periodontal bacterial levels over a one-year period.62

However, it is also known that, over time, even patients who have been trained in oral hygiene care revert to old habits. Therefore, any gains in adherence to appropriate home care must be repeatedly reinforced.63 Patients have also been found to revert to old habits once the novelty effect of a powered brush has worn off.64 Therefore, it is important to reinforce the use of the selected brushing and interdental cleaning methods at every recall appointment by providing in-office instructions and motivating patients to use oral hygiene aids. Obtaining a written commitment from patients regarding a home oral care regimen has also been found to result in an increased rate of compliance with interdental cleaning requirements, leading to lower plaque indices.65

**Fluoride**

Patients from all age groups are at risk for caries and may require intervention to address this and to prevent lesions from developing. Additionally, noncompliance in periodontal patients is associated with an increased root caries incidence. Caries can be prevented with the routine use of fluoride-containing over-the-counter dentifrices. For at-risk patients, higher-level fluoride dentifrices and in-office fluoride therapy may be required. Fluoride dentifrices are available as prescription or office-dispensed products at a 1.1% sodium fluoride concentration (5000 ppm fluoride). 1.1% sodium fluoride has been shown to reduce, arrest and even reverse caries.66,67 In the past, 1.1% fluoride gels were available for home use, to be applied using a tray. This required the patient to perform a separate activity (application of the fluoride) in addition to brushing and interdental cleaning, which was a significant factor in noncompliance.68 More recently, 1.1% fluoride dentifrices have become available for use in place of a regular fluoride dentifrice — removing the need for a separate step and thereby offering an opportunity to improve patient compliance.

**Preventive compliance and the younger patient**

Preventive compliance is low in regularly attending pediatric patients, and it has been shown that in-office preventive interventions may be necessary.69 Noncompliant parents also behave as proxies for younger pediatric patients. Motivational interviewing and counseling of parents has been found to improve compliance and children’s oral health outcomes, compared to only traditional education of parents and their young children at high risk for caries. Counseling and follow-up phone calls over the course of a year resulted in a reduced caries experience for the children. In addition, it was found that children in this group received more fluoride varnish treatments for caries prevention than did children in the group that did not receive motivational interviewing and counseling.70 Behavioral techniques have also been used to influence parents, with the end goal being healthier children.71
Utilizing techniques that incorporate existing habits into preventive care is advantageous. An example is the patient who chews gum. If a patient already chews gum, recommending and requesting that he or she use a gum containing xylitol for caries prevention provides a benefit without requiring that the patient do anything additional — other than purchasing a different brand of chewing gum.

**Compliance and In-office Care**

Patient perceptions of discomfort and fear of pain and needles all contribute to reduced attendance or nonattendance of dental treatment appointments. Beyond this problem, patients who do attend may be noncompliant with treatment recommendations. Utilizing technology and techniques that help prevent or reduce discomfort and pain and help improve the patient experience is key in helping patients accept treatment.

Parental noncompliance results in poor oral hygiene on behalf of the child (and/or poor habits being developed by the child) and in nonattendance or reduced attendance for examinations, treatment and recalls — harming oral health outcomes for the young child. Attendance and compliance at a young age help prevent oral health problems throughout life, and disadvantaged populations suffer a higher caries risk. Noncompliance by adult periodontal patients has also been found to impact the caries experience, with erratic attendance and for maintenance visits being associated with an increased level of root caries.

In-office topical fluorides are an important component of prevention programs. Options available include tray-applied gels and foams as well fluoride varnishes. The fluoride therapy selected may influence patient compliance, particularly in children and teens. Traditionally, tray-applied gels and foams have been used in the United States and have been found to reduce caries by 28% in permanent teeth in the under-17 age group. The caries reduction in DMFS achieved with 5% sodium fluoride varnish has been found to be +6% (ranging from 30% to 63%) and 33% for dmfs (ranging from 19% to 48%).

Unlike tray-applied gels and foams, no tray is required with varnish; the varnish is applied using a disposable applicator such as a microbrush, or in the case of unit doses, using the applicator that comes with the unit dose. Since a tray is not required and the application is quick and simple, the patient will not experience the gagging that may be associated with tray use, and the procedure is less messy. This allows for increased patient comfort and may help patients avoid the embarrassment and distress that results from gagging. Using a white or clear varnish may also help patient compliance by removing the objection of applying a “yellow” color to the teeth. Fluoride varnish can be used in young children at risk for early childhood caries, whereas gels and foams are contraindicated in children under 6 years of age. Fluoride varnish can be used in all age groups; it minimizes the ingestion of fluoride and lowers blood plasma fluoride levels following application, when compared to the use of gels. As with all products, use is contraindicated in patients with allergies to ingredients in the product (in the case of varnish, allergy to colophony). It should also be noted that there is no scientific basis or evidence to support locally dabbing gels and foams onto teeth in young children.

In periodontal patients, treatment is essential to prevent the continued progression of periodontal disease and eventual tooth loss, as well as to prevent any systemic results associated with periodontal disease, such as an increased risk of poor glycemic control in diabetics and an increased overall risk of cardiovascular disease, renal disease, pulmonary disease and other conditions. Ojima et al. found that 26% of patients did not comply with their first visit for periodontal maintenance.

Both periodontal patients and patients requiring restorations may avoid treatment because they anticipate pain or fear needles. It may be possible to coax patients with a mild to moderate fear of needles to receive injections and treatment, using a gentle injection technique that involves topical anesthesia and slow, careful injection of local anesthesia. For nonsurgical periodontal patients, the use of a locally applied anesthetic rather than injectable anesthesia has been shown to improve the patient experience and may improve overall compliance.

With respect to periodontal patients requiring nonsurgical periodontal therapy (scaling and root planing), ultrasonic scalers have been found to result in less patient discomfort than hand scalers. Ultrasonic scalers that require the application of less pressure, generate less heat, and regulate the amount and temperature of the coolant help reduce patient discomfort. A careful technique is required, and using a light touch can help reduce discomfort and sensitivity. Of the two types of ultrasonic scalers available — magnetostriuctive and piezoelectric — it has been claimed that the latter results in lower pain perception. A number of studies, however, have found no differences in patients’ pain perceptions with use of either type of scaler.

Slim, narrow tips are an improvement over wider inserts and help reduce tissue distension, and can therefore help reduce patient discomfort. An ultrasonic scaler that uses insert tips around their full circumference reduces angulation issues and may thereby also reduce tissue distension. Units that can be operated at a higher frequency may also help reduce patient discomfort, as may using a unit that automatically adjusts the tip
speed upward when encountering calculus and reduces the tip speed again when leaving that site.

Table 5. Factors in patient comfort

| Anesthesia — type selected and technique |
| Chair position |
| Lack of gagging |
| Instrumentation selected |
| Ultrasound scaler with light touch, slip tips, low coolant requirements |
| Optional sedation |

Summary

Patient noncompliance is a well-recognized problem, and it continues to be a major obstacle to appropriate care that ensures patients’ health and well-being.

Interventions that may help patient compliance include patient communication and education, behavioral modification programs, psychological help and selected therapies, and improved home care regimens. Ensuring that patients understand the need for treatment and providing patient-friendly treatment can also help. Utilizing technology and techniques that help improve the patient experience is key in helping patients accept treatment. Compliance with home care is one of the greatest issues in dental care. Providing patients with supportive programs and home regimens that enable patients to complete home care in the most effective and simplest manner can assist with home care compliance.

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Dr. Fiona M. Collins has clinical, marketing, education and training, and professional relations experience. Dr. Collins is a past member of the Academy of General Dentistry Foundation Strategy Board and has been a member of the British Dental Association, the Dutch Dental Association and the American Dental Association. Dr. Collins earned her dental degree from Glasgow University and holds an MBA and an MA from Boston University.

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Questions

1. Noncompliance is __________.
   a. nonadherence or partial adherence to health-related behaviors
   b. a problem for medical care
   c. a problem for dental care
   d. all of the above

2. Noncompliance in periodontal patients results in __________.
   a. poor periodontal treatment outcomes
   b. rheumatoid arthritis
   c. an increased incidence of root caries
   d. a and c

3. Noncompliance during orthodontic treatment results in __________.
   a. poor oral hygiene and associated decalcification
   b. potentially longer duration of treatment
   c. wider brackets being used
   d. a and b

4. Internal factors associated with noncompliance can include __________.
   a. fear and anxiety about visiting the dentist or hygienist
   b. lack of understanding and poor communication
   c. a perception that treatment and/or oral care is unimportant
   d. all of the above

5. External factors associated with noncompliance can include __________.
   a. poor communication or involvement by providers (and others)
   b. stress
   c. socioeconomic status
   d. all of the above

6. __________ may help address noncompliance.
   a. Patient education
   b. Behavior modification programs
   c. Improved home care regimens
   d. all of the above

7. Studies have found that supplementing oral communication with __________ may result in greater patient compliance.
   a. written communication
   b. computer-generated information
   c. web-based education
   d. all of the above

8. Information that frames behavior change as a __________ has been found to result in improvements in oral care.
   a. loss
   b. gain
   c. loss and gain
   d. none of the above

9. All studies have found that improving a patient’s self-esteem __________ difference to patient compliance.
   a. makes a small
   b. makes a great
   c. makes no
   d. none of the above

10. The transtheoretical model includes __________.
    a. precontemplative, contemplative, preparative, decision and maintenance phases
    b. precontemplative, contemplative, preparative, action and maintenance phases
    c. precontemplative, contemplative, preparative, decelerative and stability phases
    d. none of the above

11. Self-care behavior can be influenced by concrete planning of care, with very specific directions about __________ to perform oral hygiene procedures.
    a. where
    b. when
    c. how
    d. all of the above

12. Noncompliance with appropriate use of interdental brushes and fluoride toothpaste has been found to be __________ of poor overall compliance.
    a. a collaborative predictor
    b. a dependent predictor
    c. an independent predictor
    d. none of the above

13. Many patients brush for __________, and more than half of dental hygienists in one survey reported that __________ of their patients flossed daily.
    a. only thirty seconds; less than one-third
    b. only one minute; less than one-third
    c. only one minute; less than half
    d. none of the above

14. Self-reported compliance is always __________ actual compliance.
    a. lower than
    b. the same as
    c. higher than
    d. none of the above

15. Using an electric toothbrush can __________.
    a. help noncompliant patients
    b. reduce the effort required to brush
    c. reduce the time required to brush
    d. all of the above

16. Patients have been found to __________.
    a. revert to old habits
    b. increase compliance if written commitment to a home care regimen is obtained
    c. require repeated reinforcement for oral hygiene
    d. all of the above

17. Intertental cleaning aids include __________.
    a. floss
    b. interdental brushes
    c. interdental brush heads for powered brushes
    d. all of the above

18. The standard oral hygiene regimen is a __________ procedure.
    a. one-step
    b. two-step
    c. multi-step
    d. none of the above

19. 1.1% sodium fluoride dentifrice has been shown to __________.
    a. reduce
    b. arrest
    c. reverse
    d. all of the above

20. Motivational interviewing and counseling of parents has been found to __________.
    a. improve compliance
    b. result in more fluoride varnish treatments for caries prevention for children in this group
    c. improve children’s oral health outcomes
    d. all of the above

21. If a patient already chews gum, recommending and requesting that he or she use a gum containing xylitol for caries prevention __________.
    a. provides a benefit
    b. requires the patient to change habits
    c. does not require the patient to change habits
    d. a and c

22. In-office topical fluoride options include __________.
    a. tray-applied gels
    b. tray-applied foams
    c. fluoride varnishes
    d. all of the above

23. Fluoride varnishes have been found to reduce DMFS by __________ and dmfs by 33%.
    a. 42%
    b. 44%
    c. 46%
    d. 49%

24. Removing the need for tray use to apply fluoride __________.
    a. results in a quick and simple application
    b. means the patient will not experience the gagging associated with tray use
    c. results in a change in patient discomfort
    d. a and b

25. Ojima et al. found that __________ of patients did not comply with their first periodontal maintenance visit.
    a. 22%
    b. 26%
    c. 32%
    d. 36%

26. Slim, narrow tips __________.
    a. are an improvement over wider tips
    b. help reduce tissue distention
    c. help reduce patient discomfort
    d. all of the above

27. Ultrasonic scalers that __________ help reduce patient discomfort.
    a. require less pressure to be applied
    b. generate less heat
    c. regulate the amount and temperature of the coolant
    d. all of the above

28. If a patient’s fear of needles, pain and visiting the dentist in general is pathological, __________.
    a. the patient is a candidate for gene therapy
    b. the patient is a candidate for psychosurgery
    c. the patient is a candidate for psychological counseling
    d. a and b

29. Ideal oral hygiene aids and techniques make brushing and interdental cleaning __________.
    a. less effective
    b. more effective
    c. easier within a given period of time
    d. b and c

30. In one study of 874 patients who had been receiving periodontal maintenance therapy for ten years, only __________ were found to be compliant in terms of home care.
    a. 38.8%
    b. 42.6%
    c. 45.8%
    d. none of the above
Requirements for successful completion of the course and to obtain dental continuing education credits: 1) Read the entire course. 2) Complete all information above. 3) Complete answer sheets in either pen or pencil. 4) Mark only one answer for each question. 5) A score of 70% on this test will earn you 2 CE credits. 6) Complete the Course Evaluation below. 7) Make check payable to PennWell Corp.

Educational Objectives
1. List and describe the factors involved in patient noncompliance.
2. List the methods that can be used to help compliance.
3. Describe the techniques and aids that can be used to assist with patient home care compliance.
4. List and describe the factors and techniques that can help improve patient compliance with treatment.

Course Evaluation
Please evaluate this course by responding to the following statements, using a scale of Excellent = 5 to Poor = 0.
1. Were the individual course objectives met?
   Objective #1: Yes No Objective #3: Yes No
   Objective #2: Yes No
2. To what extent were the course objectives accomplished overall? 5 4 3 2 1 0
3. Please rate your personal mastery of the course objectives. 5 4 3 2 1 0
4. How would you rate the objectives and educational methods? 5 4 3 2 1 0
5. How do you rate the author's grasp of the topic? 5 4 3 2 1 0
6. Please rate the instructor's effectiveness. 5 4 3 2 1 0
7. Was the overall administration of the course effective? 5 4 3 2 1 0
8. Do you feel that the references were adequate? Yes No
9. Would you participate in a similar program on a different topic? Yes No
10. If any of the continuing education questions were unclear or ambiguous, please list them.
11. Was there any subject matter you found confusing? Please describe. _____________________________________________________
   _____________________________________________________
   _____________________________________________________
   _____________________________________________________

12. What additional continuing dental education topics would you like to see? ____________________________________________
   _____________________________________________________
   _____________________________________________________
   _____________________________________________________

Mail completed answer sheet to
Academy of Dental Therapeutics and Stomatology,
A Division of PennWell Corp.
P.O. Box 116, Chesterland, OH 44026 or fax to: (440) 845-3447

COURSE CREDITS/COST
For IMMEDIATE results, go to www.ineedce.com and click on the button “Take Tests Online.” Answer sheets can be faxed with credit card payment to (440) 845-3447, (216) 398-7922, or (216) 255-6619.

If paying by credit card, please complete the following: □ MC □ Visa □ AmEx □ Discover

Acct. Number: ___________ Exp. Date: ___________

Charges on your statement will show up as PennWell

PLEASE COPY PHOTOGRAPH ANSWER SHEET FOR ADDITIONAL PARTICIPANTS.