

## PERSONNEL HEALTH ELEMENTS OF INFECTION CONTROL IN THE DENTAL HEALTH-CARE SETTING

### LIČNI ZDRAVSTVENI ELEMENTI KONTROLE INFEKCIJE U STOMATOLOŠKOJ PRAKSI

*Richard D. Bebermeyer, DDS, MBA<sup>1</sup>; Sharon K. Dickinson, CDA, CDPM, RDA<sup>2</sup>; Lisa P. Thomas, RDH, DDS<sup>3</sup>; and June Sadowsky, DDS, MPH<sup>4</sup>*

<sup>1</sup>THE UNIVERSITY OF TEXAS HEALTH SCIENCE CENTER AT HOUSTON DENTAL BRANCH; <sup>2</sup>EL PASO COMMUNITY COLLEGE; <sup>3</sup>THE UNIVERSITY OF TEXAS HEALTH SCIENCE CENTER AT HOUSTON DENTAL BRANCH 6516 M.D. ANDERSON BOULEVARD; <sup>4</sup>THE UNIVERSITY OF TEXAS HEALTH SCIENCE CENTER AT HOUSTON DENTAL BRANCH

#### Abstract

*In December 2003, the U.S. Centers for Disease Control and Prevention published Guidelines for Infection Control in Dental Health-Care Settings - 2003, updating previous recommendations and providing additional recommendations for infection control in dental health-care settings. These recommendations—which serve as guidelines for dental practice—were developed and reviewed by authorities on infection control and prevention from Centers for Disease Control and Prevention and other relevant public agencies, as well as from academia, and professional organizations. This article serves to review personnel health elements of infection control, as presented in this guideline. These elements include: education and training, immunization programs, exposure prevention and post-exposure management, work restrictions for some medical conditions, and methods of preventing transmission of bloodborne pathogens through hand hygiene, and use of personal protective equipment. This review is intended to support and facilitate optimal infection control and prevention in dental health-care settings.*

**Key words:** Infection control, dental; transmission; methods; standards; legislation and jurisprudence; dental instruments; dental equipment; sterilization; disinfection

#### Introduction

In December 2003, the U.S. Centers for Disease Control and Prevention (CDC) published *Guidelines for Infection Control in Dental Health-Care Settings - 2003*, using the latest scientific research to update previous recommendations and to provide additional recommendations for infection control in dental health-care settings.<sup>1</sup> These recommendations, based on a review of the science related to dental infection control, serve as guidelines for dental practice. They were

#### Kratak sadržaj

*Decembra 2003. godine, Američki centar za kontrolu bolesti i prevenciju objavio je Uputstva za kontrolu infekcije u stomatološkoj praksi – 2003, dopunio prethodna uputstva i izdao nove preporuke za kontrolu infekcije u stomatološkoj praksi. Ove preporuke, koje služe kao smernice u stomatološkoj praksi, pregledane su od strane autoriteta za kontrolu infekcije i prevenciju u Centru za kontrolu bolesti i prevenciju i drugih relevantnih javnih agencija, kao i akademskih i profesionalnih organizacija. Ovaj članak služi kao pregled ličnih zdravstvenih elemenata kontrole infekcije. Elementi uključuju: edukaciju i praksu, programe imunizacije, prevenciju izlaganja i kontrolu nakon izlaganja, radna ograničenja u pojedinim medicinskim uslovima, metode prevencije prenošenja patogena krvi higijenom ruku i korišćenje opreme za ličnu zaštitu. Ovaj članak ima za cilj da podrži i olakša optimalnu kontrolu infekcije i prevenciju u stomatološkoj praksi.*

**Ključne reči:** kontrola infekcije, stomatološki, prenošenje, metode, standardi, propisi i pravne norme, stomatološki instrumenti, stomatološka oprema, sterilizacija, dezinfekcija

#### Uvod

Decembra 2003. godine, Američki centar za kontrolu bolesti i prevenciju objavio je *Uputstva za kontrolu infekcije u stomatološkoj praksi – 2003*, dopunio prethodna uputstva i izdao nove preporuke za kontrolu infekcije u stomatološkoj praksi.<sup>1</sup> Ove preporuke, koje se baziraju na pregledu stomatološke kontrole bolesti, služe kao smernice u stomatološkoj praksi, pregledane su od strane autoriteta za kontrolu infekcije i prevenciju u Centru za kontrolu bolesti i

developed and reviewed by authorities on infection control and prevention from Centers for Disease Control and Prevention and other relevant public agencies, as well as from academia, and professional organizations. This article serves to review personnel health elements of infection control, as presented in this guideline. These elements include: education and training, immunization programs, exposure prevention and post-exposure management, work restrictions for some medical conditions, and methods of preventing transmission of bloodborne pathogens through hand hygiene, and use of personal protective equipment. This review article is intended to support and facilitate optimal infection control and prevention in dental health-care settings.

### ***Standard Precautions Defined***

Previous CDC recommendations regarding infection control for dentistry focused on the risk for transmission of bloodborne pathogens among dental health care personnel (DHCP) and patients. These practices, referred to as Universal Precautions, focused on the concept that all blood and body fluids might be contaminated and should be treated as infectious. Previous practices included the use of protective barriers or personal protective equipment (PPE), the handling of instruments, use of rubber dam and hand washing. Although not widely recognized, in 1996 the CDC expanded the concept and changed the term to Standard Precautions. Standard Precautions integrated and expanded the elements of Universal Precautions into a standard of care designed to protect DHCP and patients from pathogens that can be spread by blood; all body fluids, secretions, and excretions (except sweat), regardless of whether they contain blood; non-intact skin; and mucous membranes. Saliva has always been considered a potentially infectious material.<sup>1</sup>

### ***Education and training***

Dental health-care personnel (DHCP) are better able and more likely to comply with an infection control program when they are educated to understand its rationale.<sup>1</sup> Each dental health-care setting can ensure efficient and effective coordination of infection control protocols when policies, procedures and guidelines are clearly written, and when DHCP are well-educated and trained. Therefore, both to comply with any regulations, such as those of the U.S. Occupational Safety and Health

prevenciju i drugih relevantnih javnih agencija, kao i akademskih i profesionalnih organizacija. Ovi elementi uključuju: edukaciju i praksu, programe imunizacije, prevenciju izlaganja i kontrolu nakon izlaganja, radna ograničenja u pojedinim medicinskim uslovima, metode prevencije prenošenja patogena krvi higijenom ruku i korišćenje opreme za ličnu zaštitu. Ovaj članak ima za cilj da podrži i olakša optimalnu kontrolu infekcije i prevenciju u stomatološkoj praksi.

### ***Standardne definisane mere opreza***

Prethodne preporuke Centra za kontrolu bolesti, koje se tiču kontrole infekcije u stomatologiji, fokusirale su se na rizik od prenošenja patogena iz krvi među zdravstvenim osobljem i pacijentima. Ove preporuke, koje se definišu kao univerzalne mere opreza, ukazuju da krv i sve telesne tečnosti mogu biti kontaminirane, zbog čega ih treba tretirati kao infektivne. Prethodne preporuke uključile su i upotrebu zaštitnih barijera i lične zaštitne opreme, rukovanje instrumentima, upotrebu rubber dam i pranje ruku. Premda ova uputstva nisu bila opšteprihvaćena, 1996. godine Centar za kontrolu bolesti proširio je koncept i promenio naziv u Standardne mere opreza. Standardne mere opreza integrisale su i proširile elemente Univerzalnih mera opreza u standard nege koji bi trebalo da zaštiti zdravstveno osoblje stomatološke službe, kao i pacijente od patogena koji se prenose putem krvi, telesnih tečnosti, sekreta, izlučevina (osim znoja), bez obzira da li oni sadrže krv ili ne, oštećenog dela kože, mukoznih membrana. Pljuvačka se uvek smatrala potencijalno infektivnim materijalom.<sup>1</sup>

### ***Edukacija i obuka***

Zdravstveno osoblje stomatološke službe se bolje i lakše uklapa u program zaštite od infekcija kada su obučeni da shvate njegove osnovne principe<sup>1</sup>. U svim stomatološkim uslovima može da se omogući efikasna i efektivna koordinacija protokola zaštite od infekcije kada su osiguranje, procedure i uputstva jasno definisani, a osoblje dobro edukovano i obučeno. Stoga, da bi se ispoštovale norme, kao što su one koje propisuje Američka zdravstvena bezbednost i očuvanje zdravlja, i da bi se ispoštovala uputstva za

Administration (OSHA) and to ensure compliance with infection control guidelines, each office must have education and training on a regular basis.<sup>2</sup> It is recommended that one person in the office be assigned responsibility for infection control training and compliance. There are many resources available for education and training, including resources of organizations such as the American Dental Association (ADA), the CDC, and Organization for Safety & Asepsis Procedures (OSAP) whose goal is to facilitate optimal office infection control (Table 1).<sup>3</sup>

zaštitu od infekcije, svaki sektor mora da uvede regularnu edukaciju i obuku.<sup>2</sup> Preporučuje se da jedna osoba u ordinaciji mora da bude zadužena za obuku za kontrolu infekcije. Na raspolaganju je više resursa u procesu edukacije i obuke, i to su npr.: Američka asocijacija stomatologa, Centar za kontrolu bolesti, kao i Organizacija za bezbednost i primenu procedure asepsise, koje imaju za cilj da olakšaju kontrolu infekcije u radnim uslovima (Tabela 1).<sup>3</sup>

## OSAP Chart & Checklist



### The Right PPE for the Purpose

The personal protective equipment (PPE) employed for any given task should protect workers against any hazards to which they otherwise could be exposed while performing the task or procedure. Is proper PPE in place in your practice? Check compliance in your practice setting against OSAP's checklist for proper PPE.

#### Tasks

##### At chairside:

Tasks	PPE Required							None
	Gloves (patient-care)	Face Protection (e.g., mask, face shield)	Eye Protection (e.g., safety glasses, face shield)	Garment (e.g., lab coat, gown)	Utility Gloves (nitrile-impervious)	Other* (see below)	Comment† (see below)	
Greeting the patient in the reception area								X
Taking a medical history							1,2	X
Performing an oral exam	X	3	3	X			1	
Polishing teeth	X	X	X	X				
Scaling (manual)	X	X	X	X				
Scaling (ultrasonic)	X	X	X	X				
Suctioning during a cavity preparation	X	X	X	X				
In-operative charting							1,2	X
Taking an impression	X	3	3	X			1	
Answering the telephone during treatment							2	X

##### Instrument reprocessing

Placing instruments in a holding solution (to keep them moist until they can be cleaned)		X	X	X	X			
Loading the ultrasonic cleaner / instrument washer		X	X	X	X			
Handscrubbing instruments		X	X	X	X			
Wrapping instruments for sterilization							1	
Loading the sterilizer					X		1	
Removing instrument packs from the sterilizer							4	
Distributing/storing wrapped, sterile instrument packets								X

##### Operatory clean-up

Transporting instruments from operatory to reprocessing area	X			X			1	
Environmental surface disinfection (using spray-wipe-spray technique)		X	X	X	X			
Placing a clean surface barrier on an uncontaminated surface							1	X

##### Maintenance / quality control

Cleaning the ultrasonic chamber, discarding and replacing solution		X	X	X	X			
Recording results of sterilizer monitoring								X

##### \* Other / Comments:

- (1) Although some PPE may not be required, it is acceptable to leave in place mask, eyewear, or clothing that has been worn throughout patient treatment. Never wear personal protective equipment in break rooms, offices, or reception areas.
- (2) Alternative to removing gloves, vinyl overgloves (foodhandlers gloves) can be donned to limit the spread of contamination to touch surfaces during treatment interruptions.
- (3) Optional; may provide additional protection against non-bloodborne disease transmission.
- (4) Heat-resistant gloves protect against burns from hot instrument packs.

Table 1  
Tabela 1

## ***Primary modes of infection prevention and control***

Since dental professionals in direct contact with their patients are at high risk of contracting hepatitis and other common infectious diseases from their patients, organizations such as the ADA, the CDC, and the Occupational Safety and Health Administration (OSHA) recommend vaccinations against hepatitis B in addition to common immunizations listed in Appendix B of the *Guidelines for Infection Control in Dental Health-Care Settings -2003*.<sup>1</sup> OSHA regulations in the U.S. require that employers pay for the hepatitis B vaccine, and to make it available to employees within ten working days when duties might result in exposure. Although vaccinations help protect DHCP from hepatitis B and other diseases, they are not substitutes for optimal barrier and infection control techniques.

Each patient submitting to dental treatment must complete a thorough and comprehensive health history prior to the initial examination. This history includes specific items pertaining to current conditions, current medications, current and chronic illnesses, and risk factors. Sample high-quality health history forms are available from dental suppliers, from dental schools, and from professional organizations such as the ADA. The health history is updated at each dental visit, and it is recommended that the patient sign or initial each change in medical status.

## ***Exposure prevention and post-exposure management/policy***

Every dental health-care setting must have a written exposure control plan, as required by the U.S. Occupational Safety and Health Administration's (OSHA) Bloodborne Pathogens Standard.<sup>2</sup> The OSHA exposure control plan is clearly identified in the CDC Guidelines as part of the personnel health elements of an infection-control program. This exposure control plan must clearly describe how the office complies with the Bloodborne Pathogens Standard, and must be reviewed and updated at least annually. A copy must be accessible to all employees. Aspects of the exposure control plan include: use of standard precautions, required use of personal protective equipment, standard policy on cleaning and disinfection, policy on waste disposal, policy on sterilization (including monitoring) and disinfection, use of sharps containers, stan-

## ***Primarni modusi prevencije i kontrole infekcije***

S obzirom da su stomatolozi u direktnom kontaktu sa svojim pacijentima, izloženi su opasnosti od infekcije hepatitisa i ostalih bolesti. Stoga su organizacije, poput Američke asocijacije stomatologa, Centra za kontrolu bolesti i Organizacije za bezbednost i primene procedure asepsa, preporučile vakcinaciju protiv hepatitisa B, pored opšte imunizacije koja je navedena u dodatku B *Uputstava za kontrolu infekcije u stomatološkoj praksi - 2003*.<sup>1</sup> Propisi Američke zdravstvene bezbednosti i očuvanja zdravlja nalažu da poslodavci snesu troškove vakcinacije protiv hepatitisa B i da je svojim zaposlenima omoguće u okviru deset radnih dana kada su na svom radnom mestu izloženi riziku. Premda vakcinacija pomaže osoblju stomatološke službe da se zaštiti od hepatitisa B i ostalih bolesti, ona ne predstavlja zamenu za optimalnu zaštitu i tehnike kontrole infekcije. Svaki pacijent koji se javi za stomatološki pregled mora detaljno da popuni podatke o istoriji svoje bolesti pre prvog pregleda. Ova istorija uključuje specifične podatke koji se tiču trenutnog stanja, lekova koji se koriste, akutne ili hronične bolesti i faktora rizika. Jednostavne, visokokvalitetne istorije bolesti mogu se dobiti od dobavljača, stomatoloških fakulteta i profesionalnih organizacija, kao što je na primer Američka asocijacija stomatologa. Istorija bolesti dopunjuje se prilikom svake posete stomatologu i preporučuje se da pacijent potpiše ili naznači svaku promenu u svom zdravstvenom statusu.

## ***Prevencija izlaganja i propisi/lečenje nakon izlaganja***

Svaka stomatološka ordinacija mora da ima napisan plan za kontrolu izlaganja, kao što to zahtevaju Standardi o prenošenju patogena putem krvi, Američke zdravstvene bezbednosti i očuvanja zdravlja.<sup>2</sup> Ovaj plan jasno je definisan u Uputstvima centra za kontrolu bolesti kao deo zdravstvenih elemenata programa za kontrolu infekcije. Ovaj plan mora jasno da opiše kako ordinacija mora da se povinuje Standardima o prenosivim patogenima putem krvi i mora se revidirati i dopunjavati godišnje. Primerak ovog plana mora biti dostupan svim zaposlenima. Aspekti plana za kontrolu izlaganja uključuju: primenu mera opreza,

dard hand-washing protocol, vaccination protocol, and post exposure evaluation and medical follow-up. Written protocols should be consistent with all federal, state and local regulations and should emphasize procedures to facilitate prompt reporting, evaluation, counseling, treatment, and medical follow-up of all occupational exposures.

### ***Medical conditions, work-related illness, and work restrictions***

Although DHCP are responsible for monitoring their own health status, they should discuss with a personal physician any condition which could affect the ability to safely perform work duties. There may be certain circumstances in which the decision is made to exclude DHCP from work or patient contact to prevent chance of further cross-infection. It is recommended these exclusion policies be written, include a statement of authority that defines who can exclude DHCP (e.g., the personal physician), and be clearly communicated in education and training. Better policies encourage DHCP to report illnesses or exposures without risking wages, benefits, or employment status. The CDC's guidelines clearly list suggested work restrictions for many diseases or problems that can occur in our profession.<sup>1</sup>

### ***Personal protective equipment***

Choosing the correct personal protective equipment (PPE) for each task in a dental practice is charted in Table 1, reprinted here with permission of the Organization for Safety & Asepsis Procedures (OSAP). As its mission statement reads, OSAP is dedicated to promoting infection control and related health and safety policies and practices supported by science and research. OSAP supports health-care workers and the public through quality education and information resources. There is a nominal membership fee for access to the latest practical and scientific information.<sup>3</sup>

### ***Protective Clothing***

Standard precautions require that personal protective equipment (PPE) or attire be chosen based on the procedure rather than on the pa-

propisanu opremu za ličnu zaštitu, standardni propis o čišćenju i dezinfekciji, propis o odlaganju otpadnog materijala, propis o sterilizaciji (uključujući i nadgledanje) i dezinfekciji, standardni protokol o pranju ruku, protokol o vakcinaciji i procenu nakon izlaganja i medicinsko praćenje. Pisani protokoli moraju biti u skladu sa federalnim, državnim i lokalnim regulativama i trebalo bi da naglase procedure koje bi olakšale brzo izveštavanje, procenu, savetovanje, lečenje i medicinsko praćenje svake vrste radnog izlaganja.

### ***Medicinski uslovi, bolesti stečene na radnom mestu i radna ograničenja***

Premda je osoblje stomatološke službe odgovorno za sopstveni zdravstveni status, trebalo bi da se konsultuje sa svojim lekarom o bilo kakvom stanju koje bi moglo da utiče na njihovu sposobnost bezbednog obavljanja radnih dužnosti. Mogu postojati izvesne okolnosti pod kojima se donosi odluka o povlačenju osoblja stomatološke službe sa posla ili kontakta sa pacijentima kako bi se sprečila mogućnost dalje unakrsne kontaminacije. Preporučuje se da se u ovim pisanim propisima nađe i odrednica koja precizira ko može da isključi osoblje stomatološke službe (npr. lični lekar opšte prakse), koju treba preneti i u toku edukacije i obuke. Jasno definisani propisi pružaju podršku osoblju stomatološke službe da prijave bolesti ili izlaganja bez rizika da će im se promeniti plata, olakšice ili radni status. Smernice Centra za kontrolu bolesti jasno navode predložena radna ograničenja za mnoge bolesti ili probleme koji se mogu javiti u našoj profesiji.<sup>1</sup>

### ***Lična zaštitna oprema***

Izbor odgovarajuće lične zaštitne opreme za bilo koju radnu aktivnost u stomatološkoj praksi predstavljen je u Tabeli 1 i objavljen u ovom radu uz saglasnost Organizacije za bezbednost i primenu procedura asepse. Kao što sam naziv ukazuje, rad ove organizacije okrenut je ka promovisanju kontrole infekcije i sličnim zdravstvenim i bezbedonosnim propisima koji su utemeljeni u nauci i istraživačkom radu. Organizacija za bezbednost i primenu procedura asepse pruža podršku zdravstvenim radnicima i javnosti putem kvalitetnog obrazovanja i sredstava javnog informisanja. Članarina za pri-

tient's health history. If spatter is expected during a procedure, then PPE is indicated. If the procedure such as interviewing the patient about medical history is not prone to spatter or risk, then PPE is not indicated. Protective clothing must cover personal clothing and skin likely to be soiled with blood or saliva. Guidelines dictate that protective clothing cover the forearms of the provider, and be capable of closing at the neck and covering the lap. Protective clothing must be changed when visibly soiled, and must be changed immediately (or as soon as feasible) if penetrated by blood or other potentially infectious fluids. Before departing the treatment area or the laboratory, the barrier protection including gloves, mask, eyewear, and gown is removed.

### ***Protective Masks, Eyewear and Face Shields***

During procedures likely to cause spatter of blood or other body fluids, a surgical mask and eye protection with solid side shields (or a face shield) are used to protect the mucous membranes of the eyes, nose, and mouth. Masks must be changed between patients, or during patient treatment, if the mask becomes moist. Reusable facial protective equipment (e.g., eyewear or shields for clinician and patient) must be cleaned with soap and water, or if visibly soiled, cleaned and disinfected between patients.

### ***Hand hygiene and care***

It is recommended DHCP wash their hands thoroughly with antimicrobial soap at the start of each day, before gloving and after removing gloves. The preferred method for hand hygiene depends on the type of procedure, the degree of contamination, and the desired persistence of antimicrobial action on the skin.<sup>(1)</sup> The CDC Guidelines offer clear instructions, in the form of a table, on hand hygiene methods and indications. Generally, the recommended time is fifteen seconds for the routine hand-wash. It is advisable to wash after removing gloves, before touching anything. Tests have shown that factors such as the method and the time spent hand-washing directly affect the reduction of harmful microbes. Scrub brushes can harm

stup najnovijim praktičnim i naučnim informacijama je minimalna.<sup>3</sup>

### ***Zaštitna odeća***

Standardne mere opreza nalažu da se lična zaštitna oprema ili odeća bira na osnovu procedure, a ne na osnovu zdravstvene istorije pacijenta. Ukoliko se za vreme intervencije očekuje da dođe do nekog prskanja, neophodno je nošenje lične zaštitne opreme. Ako u proceduri poput ispitivanja pacijenta o njegovom zdravstvenom stanju nema prskanja ili nekog drugog rizika, upotreba lične zaštitne opreme nije neophodna. Zaštitna odeća mora da se nosi preko lične odeće, jer koža može da se uprlja krvlju ili pljuvačkom. Uputstva nalažu da zaštitna odeća pokrije ruke do lakta, da može da se zatvori oko vrata i da prekrije krilo. Zaštitna odeća se mora promeniti kada se vidljivo zaprlja i mora se promeniti odmah (ili što je pre moguće) da kroz nju ne bi prošla krv ili ostale potencijalno infektivne tečnosti. Pre nego što se napusti laboratorija ili oblast u kojoj se obavlja lečenje, zaštitna sredstva uključujući i rukavice, maske, naočare i ogrtač se uklanjaju.

### ***Zaštitne maske, naočare i štitnici za lice***

Za vreme procedura kod kojih je moguće da dođe do prskanja krvi ili drugih telesnih tečnosti, koriste se hirurške maske i štitnici za oči sa tvrdom zaštitom sa strane (ili štitnici za oči), kako bi se zaštitila membrana očiju, nosa i usta. Maske se moraju menjati posle svakog pacijenta, ili za vreme tretmana, ako se maska nakvasi. Zaštitna oprema za lice koja se ponovo koristi (npr. naočare ili štitnici za lekare i pacijente) mora se oprati sapunom i vodom ili ako je vidno zaprljana, mora se dezinfikovati posle svakog pacijenta.

### ***Higijena ruku***

Preporučuje se da osoblje stomatoloških klinika redovno pere ruke antimikrobnim sapunima na početku svakog dana, pre i posle navlačenja rukavica. Izbor metode održavanja higijene ruku zavisi od procedure, stepena kontaminacije, trajanja antimikrobnog dejstva na koži.<sup>1</sup> Uputstva Centra za kontrolu bolesti

the skin integrity and are discouraged for all but the surgical scrub. After hand-washing, avoid contamination while turning off water.

### ***Selection of Antiseptic Agents***

Liquid antimicrobial soap is recommended for the dental setting. There are various categories, and the individual dental health-care worker can investigate which works best. When selecting anti-microbial soap for the practice, considerations include the spectrum and persistence of activity, whether the agent is fast-acting, the cost per use, the delivery system, and reliable vendor support and supply. Any type of hand washing product selected can become contaminated with microorganisms, or can support their growth. Containers should be kept closed and if a reusable container is used, it should be rinsed and dried before refilling. Soap should not be added to „top off” the container, as this can lead to bacterial contamination.<sup>(1)</sup>

Recently, alcohol-based hand rubs have become popular. They should contain 60% - 95% ethanol or isopropanol, and should not be used in the presence of visible soil or organic material. Evidence has shown these to be effective when used correctly an adequate amount to cover all surfaces of the hands, rubbing for 10-15 seconds and until dry. Recent studies have shown that alcohol-based hand rubs should not be used routinely in dentistry due to the high frequency of hand washing. An alcohol-based hand rub used for three or four consecutive times should be alternated with hand washing with an anti-microbial soap. Although alcohol hand rubs are rapidly germicidal when applied to the skin, they should also include such antiseptics as chlorhexidine to achieve persistent activity. The CDC's guidelines describe hand-hygiene methods and indications in more detail.<sup>(1)</sup>

### ***Contact Dermatitis and Latex Hypersensitivity***

DHCP can develop contact dermatitis from the antimicrobial soap, the powder (and fillers) used in gloves, and from latex. Allergies are of course more prevalent with repeated exposures. There are three types of skin reactions to latex; these are immediate allergic urticaria (hives), irritation contact dermatitis, and delayed contact dermatitis (rash).

pružaju jasne informacije, u smislu tabela, metoda održavanja higijene ruku ili indikacija. Generalno, preporučeno vreme za rutinsko pranje ruku je petnaest sekundi. Preporučuje se da se ruke peru nakon skidanja rukavica, pre nego što se išta dodirne. Testovi su pokazali da, faktori poput metoda i vremena koje se potroši za pranje ruku, direktno utiču na smanjenje štetnih mikroba. Oštre četke mogu da oštete integritet kože i ne preporučuju se za pranje ruku, osim za pranje ruku pre hirurških intervencija. Nakon pranja ruku, treba izbegavati kontaminaciju prilikom zatvaranja vode.

### ***Izbor antiseptičnih agenasa***

Tečni antimikrobni sapun preporučuje se za rad u stomatološkim ordinacijama. Ima nekoliko različitih kategorija i svaki pojedinac može da odredi koji od njih je najefikasniji. Pri izboru antimikrobnog sapuna treba uzeti u obzir spektar i perzistentnost aktivnosti, činjenicu da li agens deluje brzo, cenu troškova, sistem isporuke i dostupnost proizvoda. Bilo koji tip proizvoda za pranje ruku može se kontaminirati mikroorganizmima, i može da pospeši njihov rast. Posude u kojima se nalaze ova sredstva treba držati zatvorene, a ako se koristi posuda za višekratnu upotrebu, treba je isprati i osušiti pre ponovnog punjenja. Sapun ne treba sipati do samog vrha posude, jer to može da dovede do kontaminacije bakterijama.<sup>1</sup>

Od nedavno su postali popularni sapuni sa alkoholom. Oni bi trebalo da sadrže 60-95% etanola ili isopropanola i ne treba ih koristiti u prisustvu vidljivog organskog materijala. Postoje dokazi o efikasnosti ovih proizvoda kada se upotrebljavaju na pravi način, adekvatna količina koja treba da prekrije celu površinu ruku, trljanje ruku 10-15 sekundi i sušenje ruku. Nedavno sprovedene studije pokazale su da sapune bazirane na alkoholu ne treba koristiti rutinski, zbog čestog pranja ruku. Ovaj sapun posle tri ili četiri uzastopna nanošenja treba zameniti antimikrobnim sapunom. Mada sapuni sa alkoholom imaju izraženo brzo antimikrobno dejstvo, trebalo bi da sadrže i antiseptike poput hlorheksidina da bi se postigla perzistentna aktivnost. Uputstva Centra za kontrolu bolesti opisuju metode za održavanje higijene, kao i indikacije, u mnogo više detalja.<sup>1</sup>

Allergists can assist in determining whether an individual is affected by latex, by the powder or filler in the gloves, or even by the compounds in the antimicrobial soap used. Dermatitis should be treated by a physician, and the dental health-care worker should not be exposed to latex until the condition is completely healed.

Hands are more easily irritated if there is dampness under the gloves; therefore, it is best to dry hands thoroughly, and to change gloves during longer appointments. Cotton glove liners are available as an absorbent barrier. It is recommended that the dental professional who has an exudative lesion or weeping dermatitis avoid direct patient contact until the lesion is healed. The CDC guidelines further offer information on contact dermatitis and latex hypersensitivity, topics which DHCP need to review and comprehend.<sup>1</sup>

## Gloves

DHCP must wear gloves to prevent contamination of their hands when touching mucous membranes, blood, saliva, or other potentially infectious materials. Both examination and surgical gloves are manufactured as single-use disposable items. After degloving, the hands are washed immediately to avoid cross-contamination to other patients or environments. Gloves that are torn or cut are removed as soon as feasible; hands must be washed before regloving.

Gloves are task-specific and are selected based on the procedure to be performed. Types of gloves include sterile surgical gloves, examination or treatment gloves, and heavy utility gloves. These are available in both latex and vinyl. While gloved, it is essential to avoid cross-contamination caused by touching extraneous surfaces in the area (e.g., storage drawer pulls and the like). An increasingly popular type of glove is the common copolymer overglove used when retrieving instruments or medicaments during a procedure. These gloves can be slipped on over regular examination gloves then discarded to resume the procedure.

Sterile surgical gloves must meet standards for sterility assurance set by the U.S. Food and Drug Administration (FDA), and are therefore less likely to harbor pathogens that could contaminate a surgical wound.<sup>(4)</sup>

## *Kontaktni dermatitis i hipersenzitivnost na lateks*

Osoblje stomatološke službe može da dobije kontaktni dermatitis zbog upotrebe antimikrobnog sapuna, pudera koji se nalazi u rukavicama i zbog samog lateksa. Alergije su naravno češće nakon većeg broja izlaganja. Postoje tri vrste kožnih reakcija na lateks: neposredna alergijska urtikarija, iritacioni kontaktni dermatitis i odloženi kontaktni dermatitis (raš). Alergolozima mogu da pomognu u određivanju da li je osoba iritirana lateksom, puderom ili punjačima za rukavice ili jedinjenjima u antimikrobnim sapunima. Dermatitis bi trebalo da leči lekar, a radnik stomatološke službe ne bi trebalo da bude izložen lateksu dok se određeno stanje potpuno ne izleči.

Ruke se još više iritiraju ako su rukavice unutra vlažne; stoga je najbolje dobro osušiti ruke i menjati rukavice za vreme dužih intervencija. Preporučuje se da stomatolog, koji ima eksudativnu leziju ili weeping dermatitis, izbegava direktni kontakt sa pacijentima dok lezija ne zaraste. Uputstva Centra za kontrolu bolesti pružaju informacije o kontaktnom dermatitisu i hiperosetljivosti na lateks, sa čim bi osoblje stomatološke službe trebalo da bude upoznato.<sup>1</sup>

## *Rukavice*

Osoblje stomatološke službe mora da nosi rukavice da ne bi došlo do kontaminacije ruku pri kontaktu sa mukoznim membranama, krvlju, pljuvačkom i ostalim potencijalno infektivnim materijalima. Rukavice za pregled pacijenata i izvođenje hirurških intervencija proizvode se za jednokratnu upotrebu. Nakon skidanja rukavica, ruke se peru odmah da bi se izbegla unakrsna kontaminacija ostalih pacijenata ili okoline. Rukavice koje su iscepane ili rasečene uklanjaju se što je brže moguće; ruke treba prati pre ponovnog nanošenja rukavica.

Rukavice se specijalno prave za određene namene i biraju u skladu sa procedurom koja se izvodi. Tipovi rukavica uključuju sterilne hirurške rukavice, rukavice za pregled i lečenje i rukavice za široku upotrebu. One se izrađuju od lateksa i vinila. Prilikom stavljanja rukavica, najvažnije je izbegavati unakrsnu kontaminaciju do koje može doći dodirivanjem ostalih površina (npr. otvaranje fioka i slično). Izuzetno popularni tip rukavica su obične kopolim-



Appropriate gloves (e.g. puncture- and chemical-resistant utility gloves) must be used when cleaning instruments and doing housekeeping tasks involving possible contact with blood or other potentially infectious materials. Heavy utility gloves are worn when cleaning, disinfecting, mixing chemicals, changing ultrasonic solutions, and when handling contaminated instruments. When these utility gloves are punctured or damaged, they must be discarded. Utility gloves can be sterilized, or can be disinfected with a spray disinfectant and hung to dry after every use.

### ***Glove Integrity***

Glove integrity is a consideration in dental practice. Dental health care workers are often unaware of minute tears in gloves that occur during routine use. Although there is no set prescribed time for changing gloves during treatment procedures, studies have determined that gloves develop defects in thirty minutes to three hours. Glove contact with various chemicals and materials compromises integrity of latex as well as vinyl, nitrile and other synthetic materials. If the integrity of the glove is compromised, it should be changed as soon as possible. Optimal glove performance occurs by 1) maintaining short fingernails, 2) minimizing or eliminating hand jewelry, and 3) using engineering and work-practice controls to avoid injuries with sharps. Dental health care settings should develop protocols for limiting fingernail length, artificial nails and hand jewelry worn during dental care delivery. Fingernails should be short enough to allow the DHCP to thoroughly clean underneath the nails and to prevent tears in gloves. Artificial nails have shown to harbor more gram-negative microorganisms than natural nails, both before and after hand-washing. Studies have also demonstrated that skin beneath rings is more heavily colonized with bacteria than comparable areas of skin on fingers without rings. In addition, rings and artificial nails can make it difficult to put on gloves, yet make it easier for gloves to tear.<sup>(1)</sup>

### ***Pre-procedural mouthrinses***

CDC does not offer a recommendation regarding use of pre-procedural antimicrobial mouth rinses to prevent clinical infections among dental health care personnel or patients, as scientific evidence is

erne rukavice, koje se navlače preko rukavica i koje služe za izvlačenje instrumenata i uzimanje lekova u toku procedure. Ove rukavice navlače se preko redovnih rukavica za pregled i odlažu se da bi se nastavila procedura.

Sterilne hirurške rukavice moraju da zadovolje standarde o sterilnosti koje postavlja Američka organizacija za distribuciju hrane i lekova, i zbog toga ima manje mogućnosti da se na njima zadrže patogeni koji bi mogli da kontaminiraju hiruršku ranu.<sup>4</sup>

Odgovarajuće rukavice (npr. rukavice koje su otporne na bušenje i hemijske supstance) moraju se nositi kada se čiste instrumenti ili kada se obavljaju poslovi koji uključuju mogući kontakt sa krvlju ili drugim potencijalno infektivnim materijalima. Rukavice za široku upotrebu nose se kada se obavlja čišćenje, dezinfekcija, mešanje hemijskih supstanci, kada se menjaju ultrasonični rastvori, i kada se rukuje kontaminiranim instrumentima. Kada se ove rukavice probuše ili oštete, moraju se odložiti. Rukavice se mogu sterilisati, ili dezinfikovati sprejem za dezinfekciju, ili se suše nakon upotrebe.

### ***Integritet rukavica***

Ovo je činjenica o kojoj treba voditi računa u stomatološkoj praksi. Radnici ove službe često nisu svesni manjih poderotina na rukavicama koje nastaju u toku rutinskog rada. Premda ne postoji propisano vreme za menjanje rukavica u toku tretmana, studije su pokazale da se na rukavicama javljaju defekti nakon trideset minuta do tri sata. Kontakt između rukavica i različitih hemijskih supstanci i materijala kompromituje integritet lateksa, vinila nitrila i ostalih sintetičkih materijala. Ako je integritet rukavica narušen, treba ih promeniti što pre. Optimalno vreme trajanja rukavica obezbeđuje se 1) održavanjem kratke dužine noktiju; 2) minimalnim nakitom na rukama ili nenošenjem nakita; 3) upotrebom aparata, kako bi se izbegli oštri predmeti. Stomatološka služba bi trebalo da uvede protokole koji bi ograničili dužinu noktiju, aplikaciju veštačkih noktiju, ili nošenje nakita za vreme stomatoloških procedura. Nokti na rukama bi trebalo da budu dovoljno kratki da bi deo ispod noktiju mogao dobro da se očisti i da se spreči cepanje rukavica. Dokazano je da se kod veštačkih noktiju više pospešuje rast negativnih mikroorganizama nego kod prirodnih noktiju, i pre i posle pranja ruku. Neke studije pokazale su da se na koži ispod prstenja saku-

inconclusive. Some studies however have shown the possibility that a pre-procedural antimicrobial rinse (e.g., chlorhexidine gluconate, essential oils, or povidone-iodine) can reduce the numbers of oral micro-organisms in aerosols and spatter generated during routine dental procedures and can decrease the number of microorganisms introduced into the patient's bloodstream during invasive dental procedures.<sup>(1)</sup>

## Conclusion

The CDC's *Guidelines for Infection Control in Dental Health-Care Settings - 2003* provides updates to previous recommendations for infection control in dental health-care settings. One part of these guidelines for practice pertains to personnel health elements of an infection-control program, and this article provides an overview of that information. The reader is directed to additional information from agencies such as Organization for Safety and Asepsis Procedures (OSAP), the U.S. Department of Labor's, Occupational Safety & Health Administration (OSHA), and other local agencies. With appropriate leadership, education and training, each practice can select products and protocols which help to prevent and control infection.

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plja više bakterija u poređenju sa kožom prstiju bez nakita. Takođe, prstenje i veštački nokti otežavaju navlačenje rukavica, i olakšavaju njihovo cepanje.<sup>1</sup>

## Rastvori za ispiranje usta pre izvođenja procedura

Centar za kontrolu bolesti ne daje preporuke za upotrebu antimikrobnih rastvora za ispiranje usta pre izvođenja procedura kako bi se sprečile kliničke infekcije osoblja i pacijenata, iz razloga što naučni dokazi ne upućuju na neke jasne zaključke. Neke studije su, međutim, ukazale na mogućnost da se primenom ovih rastvora (hlorheksidin glukonat, esencijalna ulja, ili povidon jod) smanji broj oralnih mikroorganizama u aerosolu ili prilikom prskanja za vreme rutinske stomatološke procedure, i da se smanji broj mikroorganizama koji ulaze u krvotok pacijenta za vreme invazivne stomatološke procedure.<sup>1</sup>

## Zaključak

*Uputstva za kontrolu infekcije u stomatološkoj praksi – 2003* pružaju mogućnost abdejtovanja prethodnih preporuka za kontrolu infekcije u stomatološkoj praksi. Jedan deo ovih uputstava o praktičnom radu odnosi se na lične zdravstvene elemente programa za kontrolu infekcije, i ovaj rad pruža pregled takvih informacija. Čitalac se od strane agencija, poput Organizacije za bezbednost i primenu procedure asepsise, Američkog departmana za radnu bezbednost i očuvanje zdravlja, i drugih lokalnih agencija upućuje na dodatne informacije. Uz adekvatnu upravu, obrazovanje i obuku, svaka praksa može da odabere produkte i proizvode koji bi pomogli u sprečavanju i kontroli infekcije.

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**Adresa za korespondenciju:**

Richard D. Bebermeyer, DDS,  
Professor of Restorative Dentistry & Biomaterials  
The University of Texas Health Science Center at Houston Dental Branch  
6516 M.D. Anderson Boulevard  
Houston, Texas 77030  
Email address: [Richard.D.Bebermeyer@uth.tmc.edu](mailto:Richard.D.Bebermeyer@uth.tmc.edu)

**Address of correspondence:**

Richard D. Bebermeyer, DDS,  
Professor of Restorative Dentistry & Biomaterials  
The University of Texas Health Science Center at Houston Dental Branch  
6516 M.D. Anderson Boulevard  
Houston, Texas 77030  
Email address: [Richard.D.Bebermeyer@uth.tmc.edu](mailto:Richard.D.Bebermeyer@uth.tmc.edu)