NEVADA STATE BOARD
of
DENTAL EXAMINERS

Board Meeting & Workshops
September 18, 2015
9:00 a.m.

***ADDITIONAL* PUBLIC COMMENT:**

LETTERS REGARDING REGULATION CHANGES/AMENDMENTS

-Schedule of Fees
-Filing of Addresses
-IC Inspections
-Duties Delegable

-Anesthesia Regulations

Bradley S. Roberts D.D.S.
3047 E. Warm Springs Road #200
Las Vegas, Nevada - 89120
702-454-8773

Nevada State Board of Dental Examiners
6010 S. Rainbow Blvd, A-1
Las Vegas, Nevada 89118

Received
SEP 11 2015
NSBDE

09/10/2015

Dear Nevada State Board of Dental Examiners Members,

Patients rely on the licensed dentist to serve as the leader of the oral care delivery team. Understanding the importance of access to care and a streamlined patient experience, some of the proposed regulations suggest that the hygienist, even in the absence of the licensed dentist, be able to perform irreversible procedures. I do not believe the patient safety concerns outweigh the convenience or ease of access for our patient population.

For this reason, I am opposed to the changes proposed in the new Sections 2, 3, 4, and 5 of the Proposed Regulation before the Board.

With regard to the proposed addition of Section 1 in the Proposed Regulation, the current statute makes it clear that it is the dentist who is ultimately responsible for the diagnosis and treatment plan for a patient. The addition of Sections 1(a) and 1(d) would allow me, the dentist, to authorize the hygienist to collect data via the taking of diagnostic model impressions or the exposure of radiographs prior to examining the patient. I believe this process would help me in their diagnosis without any patient risk, and therefore **I support** this change.

Sections 1(b) and (c) propose permitting the hygienist to complete an assessment of oral health, to develop a care plan, and to allow for data collection and planning. Because there are many other factors that can impact a care plan during the actual patient exam by me, the dentist, I am **opposed** to adding these subsections to current regulations.

Sincerely,

Bradley Roberts DDS

Nevada State Board of Dental Examiners
6010 S. Rainbow Blvd, A-1
Las Vegas, Nevada 89118

Received
SEP 11 2015
NSBDE

Attn: Angelica Bejar,
Public Information-Travel Administrator

9/8/15

Dear Nevada State Board of Dental Examiners Members,

I write in support of the proposed changes to NAC 631.210. The proposed changes will afford greater efficiency in the use of the dental practice resources while maintaining the highest level of patient safety. By allowing dental hygienists to 1) expose radiographs, 2) assess the oral health of patients through medical and dental histories, radiographs, risk assessments and intraoral and extraoral procedures that analyze and identify the oral health needs and problems of patients, 3) develop a dental hygiene care plan to address the oral health needs and problems of patients described in subparagraph (I), and 4) take impressions for the preparation of diagnostic models prior to the dentist's examination of the patient, is a logical way to utilize the skills all hygienists are required to be competent to perform. Having radiographs and assessment indices completed and chairside prior to examination will keep patients safe because all the necessary components to appropriate diagnosis will be present from the start. It will make the dentist's task of diagnosis more efficient, and will ultimately result in smoother, better practice management.

The other changes proposed that would affect the amount of supervision required by dental hygienists for the administration of local anesthesia and nitrous oxide will improve delivery of dental hygiene services to the public and afford greater public access with full patient protection. It would allow the dental hygiene schedule to be expanded to times when the dentist is not present in the office, which might be more convenient for the patient, and would ultimately increase the efficiency and services available to the patients of record who benefit from local anesthesia during dental hygiene procedures. Because hygienists are fully trained in emergency procedures in the dental office as part of the dental hygiene curriculum and licensure requirements, these changes pose no increased risk to patient safety. The ultimate effect would be an improvement in the services and access afforded the patients, and concurrently improve efficiency in the use of the dental practice resources.

The proposed changes to NAC 631.210 are logical and safe improvements to the practice of dental hygiene in Nevada. I fully support the proposed changes to NAC 631.210.

Sincerely,

DDS

Nevada State Board of Dental Examiners
6010 S. Rainbow Blvd, A-1
Las Vegas, Nevada 89118

Received
SEP 14 2015
NSBDE

September 10, 2015

Dear Nevada State Board of Dental Examiners Members,

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Sincerely

James J. White DDS

1140 N Town center Dr St 170

Las Vegas NV 89144

Chenin Orthodontics

Making Smiles, Changing Lives

Stephen T. Chenin, DDS
David A. Chenin, DDS, MSD

Received
SEP 14 2015
NSBDE

Nevada State Board of Dental Examiners
6010 S. Rainbow Blvd, A-1
Las Vegas, Nevada 89118

09/10/2015

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Sincerely,

Dr. David A. Chenin, DDS, MSD

Orthodontics
Dentofacial Orthopedics
Children & Adults

10730 South Eastern Avenue, Suite 100
Henderson, Nevada 89052
P 702.735.1010 . F 702.735.6823
info@CheninOrtho.com
www.CheninOrtho.com
Visit us at www.facebook.com/CheninOrtho

Chenin Orthodontics

Making Smiles, Changing Lives

Stephen T. Chenin, DDS
David A. Chenin, DDS, MSD

Nevada State Board of Dental Examiners
6010 S. Rainbow Blvd, A-1
Las Vegas, Nevada 89118

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Sincerely,

Dr. Stephen T. Chenin, DDS

Orthodontics
Dentofacial Orthopedics
Children & Adults

DIPLOMATE AMERICAN BOARD OF ORTHODONTICS
Members American Association of Orthodontists
invisalign Elite PREFERRED PROVIDER

10730 South Eastern Avenue, Suite 100
Henderson, Nevada 89052
P 702.735.1010 . F 702.735.6823
info@CheninOrtho.com
www.CheninOrtho.com
Visit us at www.facebook.com/CheninOrtho

COMPREHENSIVE
DENTAL CARE

Gregg C. Hendrickson DDS
Oanh Y. Le DMD

(702) 735-3284
info@NVDentists.com
www.NVDentists.com

2790 W. Horizon Ridge, # 100
Henderson, NV 89052

Nevada State Board of Dental Examiners
6010 S. Rainbow Blvd, A-1
Las Vegas, Nevada 89118

Dear Nevada State Board of Dental Examiners Members,

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Sincerely

Gregg C. Hendrickson D.D.S.

MARK D.
FUNKE
D.D.S.
Restorative & Cosmetic Dentistry

Nevada State Board of Dental Examiners
6010 S. Rainbow Blvd, A-1
Las Vegas, Nevada 89118

9-10-15

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Sincerely,

1898 College Parkway, Suite 101
Carson City, NV 89706
775.882.5525

Stephen Sims D.M.D.
5365 Mae Anne Ave. Suite A-1
Reno, NV 89523

Nevada State Board of Dental Examiners
6010 S. Rainbow Blvd, A-1
Las Vegas, Nevada 89118

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Patients rely on the licensed dentist to serve as the leader of the oral care delivery team. Understanding the importance of access to care and a streamlined patient experience, some of the proposed regulations suggest that the hygienist, even in the absence of the licensed dentist, be able to perform irreversible procedures. I do not believe the patient safety concerns outweigh the convenience or ease of access for our patient population.

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Sincerely

Sept 10, 2015

Nevada State Board of Dental Examiners
6010 S. Rainbow Blvd, A-1
Las Vegas, Nevada 89118

9-10-2015

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Sincerely

Rick L. Grant DMD, IBO

Rick L. Grant DMD, IBO

Nevada State Board of Dental Examiners
6010 S. Rainbow Blvd, A-1
Las Vegas, Nevada 89118

September 14, 2015

Dear Nevada State Board of Dental Examiners Members,

Patients rely on the licensed dentist to serve as the leader of the oral care delivery team. Understanding the importance of access to care and a streamlined patient experience, some of the proposed regulations suggest that the hygienist, even in the absence of the licensed dentist, be able to perform irreversible procedures. I do not believe the patient safety concerns outweigh the convenience or ease of access for our patient population.

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Sections 1(b) and (c) propose permitting the hygienist to complete an assessment of oral health, to develop a care plan, and to allow for data collection and planning. Because there are many other factors that can impact a care plan during the actual patient exam by me, the dentist, I am **opposed** to adding these subsections to current regulations.

Sincerely

Vernon J Lamborn DDS

Received
SEP 14 2015
NSBDE

COMFORT CARE
Dental Group
Personalized and Comfortable

WE CATER TO COWARDS

Nevada State Board of Dental Examiners
6010 S. Rainbow Blvd, A-1
Las Vegas, Nevada 89118

September 10, 2015

Dear Nevada State Board of Dental Examiners Members,

Patients rely on the licensed dentist to serve as the leader of the oral care delivery team. Understanding the importance of access to care and a streamlined patient experience, some of the proposed regulations suggest that the hygienist, even in the absence of the licensed dentist, be able to perform irreversible procedures. I do not believe the patient safety concerns outweigh the convenience or ease of access for our patient population.

For this reason, I am **opposed** to the changes proposed in the new Sections 2,3,4, and 5 of the Proposed Regulation before the board.

With regard to the proposed addition of Section 1 in the Proposed Regulation, the current statute makes it clear that it is the dentist who is ultimately responsible for the diagnosis and treatment plan for the patient. The addition of Sections 1(a) and 1(d) would allow me, the dentist, to authorize the hygienist to collect data via the taking of diagnostic model impressions or the exposure of radiographs prior to examining the patient. I believe this process would help me in their diagnosis without any patient risk, and therefore I **support** this change.

Sections 1(b) and (c) propose permitting the hygienist to complete an assessment of oral health, to develop a care plan, and to allow for data collection and planning. Because there are many other factors that can impact a care plan during the actual patient exam by me, the dentist, I am **opposed** to adding these subsections to current regulations.

Sincerely,

Scott Brown D.D.S.

Scott Brown D.D.S.

Received
SEP 14 2015
NSBDE

SCOTT BROWN, DDS AND ASSOCIATES

803 SOUTH 7TH STREET • LAS VEGAS, NV 89101 • TEL (702) 384-4721 • FAX (702) 384-2183
www.ccdgp.com

Nevada State Board of Dental Examiners
6010 S. Rainbow Blvd, A-1
Las Vegas, Nevada 89118

September 10, 2015

Dear Nevada State Board of Dental Examiners Members,

Patients rely on the licensed dentist to serve as the leader of the oral care delivery team. Understanding the importance of access to care and a streamlined patient experience, some of the proposed regulations suggest that the hygienist, even in the absence of the licensed dentist, be able to perform irreversible procedures. I do not believe the patient safety concerns outweigh the convenience or ease of access for our patient population.

For this reason, I am opposed to the changes proposed in the new Sections 2, 3, 4, and 5 of the Proposed Regulation before the Board.

With regard to the proposed addition of Section 1 in the Proposed Regulation, the current statute makes it clear that it is the dentist who is ultimately responsible for the diagnosis and treatment plan for a patient. The addition of Sections 1(a) and 1(d) would allow me, the dentist, to authorize the hygienist to collect data via the taking of diagnostic model impressions or the exposure of radiographs prior to examining the patient. I believe this process would help me in their diagnosis without any patient risk, and therefore I **support** this change.

Sections 1(b) and (c) propose permitting the hygienist to complete an assessment of oral health, to develop a care plan, and to allow for data collection and planning. Because there are many other factors that can impact a care plan during the actual patient exam by me, the dentist, I am **opposed** to adding these subsections to current regulations.

Sincerely

Cody McElroy DDS

Leila Khossoosi DDS

2285 E. Flamingo Rd #101

Las Vegas, NV 89119

September 10, 2015

Nevada State Board of Dental Examiners
6010 S Rainbow Blvd
Las Vegas, NV 89118

RE: Regulations Proposed by the Nevada Hygienist Association

Dear Ms. Schafer and Board Members:

Thank you for the opportunity to provide comment.

Patients rely on the licensed dentist to serve as the leader of the oral care delivery team. Understanding the importance of access to care and a streamlined patient experience, some of the proposed regulations suggest that the hygienist, even in the absence of the licensed dentist, be able to perform irreversible procedures. I do not believe the patient safety concerns outweigh the convenience or ease of access for our patient population. For this reason, I am **strongly opposed** to the changes proposed in the new Sections 1, 2, 3, 4, and 5 of the Proposed Regulation before the Board. Once again I appreciate the opportunity to comment.

Sincerely yours,

Leila Khossoosi DDS

Received
SEP 14 2015
NSBDE

Emily Ishkanian D.M.D.

Green Valley Dental Center
275 N. Pecos Road
Henderson, NV 89135
Emily.Ishkanian@yahoo.com

Nevada State Board of Dental Examiners
6010 S. Rainbow Blvd, A-1
Las Vegas, Nevada 89118

September 13, 2015

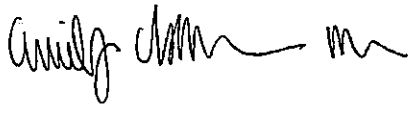
Dear Nevada State Board of Dental Examiners Members,

A licensed dentist is the leader of the oral health delivery team. With the direction and guidance of the licensed dentist, the team can effectively treat patients. Although access to care and a streamlined patient experience is extremely important, some of the proposed regulations suggest that a hygienist, in the absence of a dentist, be able to perform irreversible procedures. I do not believe the convenience or ease of access outweighs safety concerns for our patient population. For this reason, I am **opposed** to the changes proposed in the new Sections 2, 3, 4, and 5 of the Proposed Regulation before the Board.

I am also **opposed** to Sections 1(b) and (c) which would allow the hygienist to complete an assessment of oral health, to develop a care plan, and to allow for data collection and planning. As a licensed dentist and after a patient examination, I know that there are many other factors that can impact a care plan. As a result, I am **opposed** to adding these subsections to the current regulations.

Regarding, the proposed addition of Section 1 in the Proposed Regulation, it is clear that the dentist is responsible for the diagnosis and treatment plan for a patient in the current statute. The addition of Sections 1(a) and 1(d) would allow me, the dentist, to authorize the hygienist to collect data via the taking of diagnostic model impressions or the exposure of radiographs prior to examining the patient. I believe this process would help me in their diagnosis without any patient risk, and therefore I **support** this change.

Sincerely



Emily Ishkanian D.M.D.

Public Comment Submitted By *Dental Hygienists*

Nevada State Board of Dental Examiners
6010 S. Rainbow Blvd, A-1
Las Vegas, Nevada 89118

Attn: Angelica Bejar,
Public Information-Travel Administrator

September 11, 2015

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I write in support of the proposed changes to NAC 631.210. The proposed changes will afford greater efficiency in the use of the dental practice resources while maintaining the highest level of patient safety. By allowing dental hygienists to 1) expose radiographs, 2) assess the oral health of patients through medical and dental histories, radiographs, risk assessments and intraoral and extra-oral procedures that analyze and identify the oral health needs and problems of patients, 3) develop a dental hygiene care plan to address the oral health needs and problems of patients described in subparagraph (I), and 4) take impressions for the preparation of diagnostic models prior to the dentist's examination of the patient, is a logical way to utilize the skills all hygienists are required to be competent to perform. Having radiographs and assessment indices completed and chairside prior to examination will keep patients safe because all the necessary components to appropriate diagnosis will be present from the start. It will make the dentist's task of diagnosis more efficient, and will ultimately result in smoother, better practice management.

The other changes proposed that would affect the amount of supervision required by dental hygienists for the administration of local anesthesia and nitrous oxide will improve delivery of dental hygiene services to the public and afford greater public access with full patient protection. It would allow the dental hygiene schedule to be expanded to times when the dentist is not present in the office, which might be more convenient for the patient, and would ultimately increase the efficiency and services available to the patients of record who benefit from local anesthesia during dental hygiene procedures. Because hygienists are fully trained in emergency procedures in the dental office as part of the dental hygiene curriculum and licensure requirements, these changes pose no increased risk to patient safety. The ultimate effect would be an improvement in the services and access afforded the patients, and concurrently improve efficiency in the use of the dental practice resources.

The proposed changes to NAC 631.210 are logical and safe improvements to the practice of dental hygiene in Nevada. I fully support the proposed changes to NAC 631.210.

Sincerely,

Hasty Estes, RDH

Hasty Estes, RDH

Nevada State Board of Dental Examiners
6010 S. Rainbow Blvd, A-1
Las Vegas, Nevada 89118

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Public Information-Travel Administrator

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Sincerely,

Tara Conley, RDH BSDH

Nevada State Board of Dental Examiners
6010 S. Rainbow Blvd, A-1
Las Vegas, Nevada 89118

Received
SEP 11 2015
NSBDE

Attn: Angelica Bejar,
Public Information-Travel Administrator

9-9-15

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RDH, BSDH

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6010 S. Rainbow Blvd, A-1
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9/11/15

Dear Nevada State Board of Dental Examiners Members,

I write in support of the proposed changes to NAC 631.210. The proposed changes will afford greater efficiency in the use of the dental practice resources while maintaining the highest level of patient safety. By allowing dental hygienists to 1) expose radiographs, 2) assess the oral health of patients through medical and dental histories, radiographs, risk assessments and intraoral and extraoral procedures that analyze and identify the oral health needs and problems of patients, 3) develop a dental hygiene care plan to address the oral health needs and problems of patients described in subparagraph (I), and 4) take impressions for the preparation of diagnostic models prior to the dentist's examination of the patient, is a logical way to utilize the skills all hygienists are required to be competent to perform. Having radiographs and assessment indices completed and chairside prior to examination will keep patients safe because all the necessary components to appropriate diagnosis will be present from the start. It will make the dentist's task of diagnosis more efficient, and will ultimately result in smoother, better practice management.

The other changes proposed that would affect the amount of supervision required by dental hygienists for the administration of local anesthesia and nitrous oxide will improve delivery of dental hygiene services to the public and afford greater public access with full patient protection. It would allow the dental hygiene schedule to be expanded to times when the dentist is not present in the office, which might be more convenient for the patient, and would ultimately increase the efficiency and services available to the patients of record who benefit from local anesthesia during dental hygiene procedures. Because hygienists are fully trained in emergency procedures in the dental office as part of the dental hygiene curriculum and licensure requirements, these changes pose no increased risk to patient safety. The ultimate effect would be an improvement in the services and access afforded the patients, and concurrently improve efficiency in the use of the dental practice resources.

The proposed changes to NAC 631.210 are logical and safe improvements to the practice of dental hygiene in Nevada. I fully support the proposed changes to NAC 631.210.

Sincerely,

JESSICA RILEY RDH

Public Comment Submitted By *Dental Assistants*

Nevada State Board of Dental Examiners
6010 S. Rainbow Blvd, A-1
Las Vegas, Nevada 89118

Received
SEP 11 2015
NSBDE

Attn: Angelica Bejar,
Public Information-Travel Administrator

9/10/15

Dear Nevada State Board of Dental Examiners Members,

I write in support of the proposed changes to NAC 631.210. The proposed changes will afford greater efficiency in the use of the dental practice resources while maintaining the highest level of patient safety. By allowing dental hygienists to 1) expose radiographs, 2) assess the oral health of patients through medical and dental histories, radiographs, risk assessments and intraoral and extraoral procedures that analyze and identify the oral health needs and problems of patients, 3) develop a dental hygiene care plan to address the oral health needs and problems of patients described in subparagraph (I), and 4) take impressions for the preparation of diagnostic models prior to the dentist's examination of the patient, is a logical way to utilize the skills all hygienists are required to be competent to perform. Having radiographs and assessment indices completed and chairside prior to examination will keep patients safe because all the necessary components to appropriate diagnosis will be present from the start. It will make the dentist's task of diagnosis more efficient, and will ultimately result in smoother, better practice management.

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The proposed changes to NAC 631.210 are logical and safe improvements to the practice of dental hygiene in Nevada. I fully support the proposed changes to NAC 631.210.

Sincerely,

Lindsay Trejo Dental Assistant.

Nevada State Board of Dental Examiners
6010 S. Rainbow Blvd, A-1
Las Vegas, Nevada 89118

Received
SEP 11 2015
NSBDE

Attn: Angelica Bejar,
Public Information-Travel Administrator

9-8-2015

Dear Nevada State Board of Dental Examiners Members,

I write in support of the proposed changes to NAC 631.210. The proposed changes will afford greater efficiency in the use of the dental practice resources while maintaining the highest level of patient safety. By allowing dental hygienists to 1) expose radiographs, 2) assess the oral health of patients through medical and dental histories, radiographs, risk assessments and intraoral and extraoral procedures that analyze and identify the oral health needs and problems of patients, 3) develop a dental hygiene care plan to address the oral health needs and problems of patients described in subparagraph (I), and 4) take impressions for the preparation of diagnostic models prior to the dentist's examination of the patient, is a logical way to utilize the skills all hygienists are required to be competent to perform. Having radiographs and assessment indices completed and chairside prior to examination will keep patients safe because all the necessary components to appropriate diagnosis will be present from the start. It will make the dentist's task of diagnosis more efficient, and will ultimately result in smoother, better practice management.

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The proposed changes to NAC 631.210 are logical and safe improvements to the practice of dental hygiene in Nevada. I fully support the proposed changes to NAC 631.210.

Sincerely,

Epiphany Mazone
RDA in California

Nevada State Board of Dental Examiners
6010 S. Rainbow Blvd, A-1
Las Vegas, Nevada 89118

Attn: Angelica Bejar,
Public Information-Travel Administrator

9-8-2015

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The proposed changes to NAC 631.210 are logical and safe improvements to the practice of dental hygiene in Nevada. I fully support the proposed changes to NAC 631.210.

Sincerely,

Edwin Laguna DA

Nevada State Board of Dental Examiners
6010 S. Rainbow Blvd, A-1
Las Vegas, Nevada 89118

Attn: Angelica Bejar,
Public Information-Travel Administrator

9/9/15

Dear Nevada State Board of Dental Examiners Members,

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The proposed changes to NAC 631.210 are logical and safe improvements to the practice of dental hygiene in Nevada. I fully support the proposed changes to NAC 631.210.

Sincerely,

Gene Garcia

Gene Garcia Dental Assistant

Dental Assisting National Board, Inc.

Measuring Dental Assisting Excellence®

September 11, 2015

Nevada State Board of Dental Examiners
Attn: Angelica Bejar, Public Information -Travel Administrator
6010 S. Rainbow Blvd., A-I
Las Vegas, Nevada 89118,
nsbde@nsbde.nv.gov

Dear Distinguished Members of the Nevada State Board of Dental Examiners:

Please accept this letter from the Dental Assisting National Board, Inc. (DANB) in response to the Notice of Public Workshop and Request for Comments related to the proposed regulation changes that will be considered at a public workshop on September 18, 2015.

DANB is the American Dental Association-recognized national certification board for dental assistants. Our mission is to promote the public good by providing credentialing services to the dental community. DANB administers the nationally recognized Certified Dental Assistant™ (CDA®) certification program and a series of other certifications and knowledge-based competency examinations for dental assistants. DANB® exams and certifications are required or meet a part of requirements for dental assistants to qualify to perform prescribed duties in 39 states, the District of Columbia, the Department of Veterans Affairs, and the U.S. Air Force. DANB's eligible exam programs are accredited by the National Commission for Certifying Agencies (NCCA).

The currently proposed set of amendments to regulations governing delegation of duties to dental assistants (NAC 631.220) includes the addition of two functions dental assistants may perform with a dentist's authorization before the dentist has examined the patient: exposing radiographs and taking of impressions for the preparation of diagnostic models.

Because performance of these duties prior to a dentists' examination of the patient may require a higher level of discretion and judgment on the part of the dental assistants, the Board may wish to consider whether it would be appropriate to require competency testing for dental assistants who perform radiography and take impressions before a dentist has examined the patient.

DANB would like to take this opportunity to make the Nevada Board of Dental Examiners aware of examinations that DANB currently offers to measure knowledge-based competency in radiography and in taking impressions.

1. **DANB's Radiation Health and Safety (RHS®) Exam**
   DANB's Certified Dental Assistant (CDA) certification exam consists of three component exams – the Radiation Health and Safety (RHS), Infection Control (ICE®), and General Chairside (GC) exams.

   DANB's RHS exam is recognized or required for dental assistants in 22 states and the District of Columbia to qualify to perform radiography procedures. An additional 10 states recognize passing DANB's CDA exam (of which the RHS exam is one component) to meet all or part of the requirements for a dental assistant to qualify in radiography.

The RHS exam is a 75-minute, 100-question multiple choice test, offered at a fee of $175.00 (increasing to $250.00 in 2016). I am attaching the exam blueprint – a weighted content outline – for the DANB RHS exam as Attachment 1.

2. **DANB's Impressions (IM) Exam**
DANB currently administers a Certified Restorative Functions Dental Assistant (CRFDA®) certification program consisting of component exams in Anatomy, Morphology and Physiology (AMP), Isolation (IS), Impressions (IM), Temporaries (TMP), Sealants (SE), and Restorative Functions (RF).

Each of the CRFDA components can be taken as a standalone exam, or in the following groupings:

- Group 1 – Oral and Dental Anatomy, Morphology and Physiology (AMP)
- Group 2 – Impressions (IM); Temporaries (TMP)
- Group 3 – Isolation (IS); Sealants (SE); Restorative Functions (RF)

There are no eligibility prerequisites for the IM exam. The IM exam is a 60-minute, 80-question multiple choice test, offered at a fee of $100.00 (increasing to $125.00 in 2016). I am attaching the exam blueprint for the DANB IM exam as Attachment 2.

All DANB exams, including the RHS and IM exams, are administered six days per week at more than 250 proctored, computerized testing centers nationwide through DANB's computerized testing vendor, Pearson VUE. Test center locations in Nevada include sites in Reno and Las Vegas.

If the Nevada State Board of Dental Examiners would like any additional information about the DANB RHS and IM exams or any other topic addressed in this letter, please do not hesitate to contact me at klandsberg@danb.org or 1-800-367-3262, ext. 431.

Best regards,

K Landsberg

Katherine Landsberg
Assistant Director, Government Relations

CC: Cynthia C. Durley, M.Ed. MBA, Executive Director, DANB

Dental Assisting National Board, Inc.

Measuring Dental Assisting Excellence®

Radiation Health and Safety (RHS®)

Exam Blueprint and Suggested References for Exam Preparation

DANB's RHS exam is a component of the DANB National Entry Level Dental Assistant (NELDA™) and Certified Dental Assistant™ (CDA®) certifications.

NELDA component exams

Anatomy, Morphology and Physiology (AMP)
Radiation Health and Safety (RHS)
Infection Control (ICE®)

CDA component exams

General Chairside Assisting (GC)
Radiation Health and Safety (RHS)
Infection Control (ICE)

PLEASE NOTE: DANB uses "image receptor" when referring to either conventional film or sensors used for digital imaging.

Note that each state's dental board implements regulations and establishes rules for delegating legally allowable duties to dental assistants. Passing one or more of the DANB component exams or earning DANB certification only conveys authority to perform these duties in those states that recognize these exams or this certification as meeting state dental assisting requirements. This information is at www.danb.org/Meet-State-Requirements.aspx.

Dental Assisting National Board, Inc.

Measuring Dental Assisting Excellence®

Radiation Health and Safety (RHS) Exam Blueprint

(26%) I. EXPOSE AND EVALUATE

A. Assessment and Preparation
1. Describe patient preparation for radiographic exposures (e.g., inspect the patient's head and neck for removable appliances and foreign objects).
2. Select appropriate radiographic technique.
   a. Describe use and purpose of various intraoral and extraoral radiographic images.
   b. Select appropriate radiographic survey to examine or view conditions, teeth or landmarks.
   c. Describe technique modifications based on anatomical variations.
3. Select appropriate equipment for radiographic techniques.
   a. Describe purpose or advantage of accessories for radiographic techniques.
   b. Select appropriate image receptor size depending on patient characteristics and exposure technique indicated.
   c. Describe purpose and advantage of double (dual) film packets.

B. Acquire
1. Describe how to acquire radiographic images using various techniques.
   a. Define radiographic exposure concepts.
   b. Intraoral
      i. Define factors that influence quality of the radiographic image.
      ii. Compare paralleling and bisecting angle techniques, including advantages and disadvantages.
      iii. Describe the parts of a radiographic film packet, the different types of digital image receptors, and the functions of both.
   c. Extraoral
      i. Identify function and maintenance of film cassettes and intensifying screens.
      ii. Describe appropriate technique for exposing (i.e., patient positioning):
         a) panoramic radiography.
         b) cephalometric radiography.
      iii. Demonstrate basic understanding of CBCT (cone-beam computed tomography).
2. Demonstrate basic knowledge of digital radiography.
   a. Advantages/disadvantages of digital radiography.
   b. Handling errors.
   c. Image receptors.
3. Demonstrate basic knowledge of conventional film processing.
   a. Describe functions of processing solutions.
   b. Describe how to process exposed intra- and extraoral films using automatic processors.
   c. Identify optimum procedures for processing films.

C. Evaluate
1. Evaluate radiographic images for diagnostic value.
   a. Describe features of a diagnostically acceptable radiographic image.
   b. Identify and describe how to correct errors related to acquiring intraoral radiographic images.

c. Identify and correct errors related to radiographic processing.
d. Identify and describe how to correct errors due to improper film handling.
e. Identify and describe how to correct errors related to acquiring panoramic radiographic images

2. Mount and label
   a. Describe how to mount radiographic images using facial (buccal and labial) view.
      i. Identify anatomical landmarks that aid in mounting.
      ii. Match tooth views to tooth mount windows.
      iii. Demonstrate understanding of appropriate techniques for optimum radiographic image viewing.
   b. Identify anatomical structures, dental materials and patient information observed on radiographic images (e.g., differentiating between radiolucent and radiopaque areas).

D. Patient Management
   1. Describe techniques for patient management before, during and after radiographic exposure, including patients with special needs.
   2. Describe techniques for patients with a severe gag reflex.

(21%) **II. QUALITY ASSURANCE AND RADIOLOGY REGULATIONS**

A. Quality Assurance
   1. Evaluate film storage areas.
   2. Identify and describe how to correct errors related to improperly storing exposed and unexposed radiographic film.
   3. Describe how to prepare, maintain and replenish radiographic solutions for automatic processors.
   4. Identify optimum conditions for film processing.
   5. Describe how to implement quality assurance procedures.

B. Radiology Regulations
   1. Describe how to prepare radiographic images for legal requirements, viewing, duplication and transfer.
   2. Describe how to properly store chemical agents used in dental radiography procedures according to regulatory agencies, in compliance with the Occupational Safety and Health Administration (OSHA) Hazard Communication Standard.
   3. Describe how to properly dispose of all chemical agents and other materials used in dental radiography procedures.

(31%) **III. RADIATION SAFETY FOR PATIENTS AND OPERATORS**

A. Identify current American Dental Association (ADA) guidelines for frequency of exposure to radiation.

B. Apply the principles of radiation protection and hazards in the operation of radiographic equipment.
   1. Demonstrate knowledge of the factors affecting x-ray production (e.g., kVp, mA, exposure time).
   2. Describe the characteristics of x-radiation.
   3. Demonstrate understanding of x-ray machine factors that influence radiation safety (e.g., concepts of filtration, shielding, collimation, PID [cone] length).
   4. Demonstrate understanding of x-radiation physics:
      a. primary radiation.
      b. scatter (secondary) radiation.
   5. Describe protocol for suspected x-ray machine malfunctions.

C. Demonstrate knowledge of patient safety measures to provide protection from x-radiation.

1. Identify major causes of unnecessary x-radiation exposure.
2. Demonstrate an understanding of x-radiation biology:
   a. short- and long-term effects of x-radiation on cells and tissues.
   b. concepts of x-radiation dose and effective dose.
3. Identify ways to reduce x-radiation exposure to patients (ALARA).

D. Address patient concerns about radiation, including informed consent or patient refusal of radiography.

E. Demonstrate understanding of operator safety measures to provide protection from x-radiation.
1. Identify sources of x-radiation to operators/other staff while exposing image receptors.
2. Identify safety measures to reduce operator x-radiation exposure.
3. Demonstrate an understanding of x-radiation physics and biology pertaining to operator exposure.

F. Describe techniques for monitoring individual x-radiation exposure.

(22%) IV. INFECTION CONTROL

A. Standard Precautions for Equipment
1. Demonstrate an understanding of infection control techniques to minimize cross-contamination during radiographic procedures according to ADA, Centers for Disease Control and Prevention (CDC) and OSHA guidelines for conventional and digital radiography.
2. Demonstrate an understanding of barriers to minimize cross-contamination during radiographic procedures according to ADA, CDC and OSHA guidelines for conventional and digital radiography.

B. Standard Precautions for Patients and Operators
1. Demonstrate an understanding of infection control for radiographic procedures according to ADA, CDC and OSHA guidelines for conventional and digital radiography.
2. Describe infection control techniques used during radiographic processing, following ADA, CDC and OSHA guidelines.

Dental Assisting National Board, Inc.

Measuring Dental Assisting Excellence®

Radiation Health and Safety (RHS®)

Suggested References for Exam Preparation

DANB's RHS exam is a component of the DANB National Entry Level Dental Assistant (NELDA™) and Certified Dental Assistant (CDA®) certifications.

DANB exam committees use the following textbooks and reference materials to develop this exam. This list does not include all of the available textbooks and materials for studying for this exam; these are simply the resources that exam committee subject matter experts determined as providing the most up-to-date information needed to meet or surpass a determined level of competency for this exam.

This list is intended to help prepare for this exam. It is not intended to be an endorsement of any of the publications listed. You should prepare for DANB certification and component exams using as many different study materials as possible.

1. Johnson, Orlen N., and Evelyn M.Thomson. *Essentials of Dental Radiography for Dental Assistants and Hygienists.* 9th ed. Upper Saddle River, NJ: Pearson Education, 2012.
2. Ianucci, Joan M., and Laura J. Howerton. *Dental Radiography Principles and Techniques* (with CD-ROM). 4th ed. St. Louis, MO: Elsevier/Saunders, 2012.
3. Bird, Doni L., and Debbie S. Robinson. *Modern Dental Assisting.* 10th and 11th ed. St. Louis, MO: Elsevier/Saunders, 2012 and 2015.
4. Frommer, Herbert H., and Jeanine J. Stabulas-Savage. *Radiology for the Dental Professional.* 9th ed. St. Louis, MO: Elsevier/Mosby, 2011.
5. Bird, Doni L., and Debbie S. Robinson. *Essentials of Dental Assisting.* 5th ed. St. Louis, MO: Elsevier/Saunders, 2013.
6. Miles, Dale A., Margot L. Van Dis, Gail F. Williamson, and Catherine W. Jensen. *Radiographic Imaging for the Dental Team.* 4th ed. St. Louis, MO: Elsevier/Saunders, 2009.
7. Phinney, Donna J., and Judy H. Halstead. *Dental Assisting: A Comprehensive Approach.* 3rd and 4th ed. Clifton Park, NY: Delmar Cengage Learning, 2008 and 2013.
8. "An Introduction to Basic Concepts in Dental Radiography," Course #715. American Dental Assistants Association. www.dentalassistant.org
9. Miller, Chris H. *Infection Control and Management of Hazardous Materials for the Dental Team.* 5th ed. St. Louis, MO: Elsevier/Mosby, 2014.

Note that each state's dental board implements regulations and establishes rules for delegating legally allowable duties to dental assistants. Passing one or more of the DANB component exams or earning DANB certification only conveys authority to perform these duties in those states that recognize these exams or this certification as meeting state dental assisting requirements. This information is at www.danb.org/Meet-State-Requirements.aspx.

Dental Assisting National Board, Inc.

Measuring Dental Assisting Excellence®

Impressions (IM)

Exam Blueprint and Suggested References for Exam Preparation

DANB's IM exam is a component of the DANB Certified Restorative Functions Dental Assistant (CRFDA®) certification.

CRFDA component exams

Anatomy, Morphology and Physiology (AMP)
Impressions (IM)
Temporaries (TMP)
Isolation (IS)
Sealants (SE)
Restorative Functions (RF)

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Dental Assisting National Board, Inc.

Measuring Dental Assisting Excellence®

Impressions (IM) Exam Blueprint

(15%) I. PURPOSE OF IMPRESSIONS
- A. Preliminary
- B. Final (including CAD/CAM)
- C. Fixed and removable appliances/prosthetics

(55%) II. TAKING IMPRESSIONS
- A. Trays
  1. Stock
  2. Custom
  3. Placement and removal
  4. Selection
- B. Materials
  1. Irreversible hydrocolloids (i.e., alginate)
     a. Purpose/uses
     b. Characteristics
     c. Preparing/mixing
  2. Elastomerics
     a. Purpose/uses
     b. Types
        i. Polyether
        ii. Polyvinyl siloxane
        iii. Polysulfide
        iv. Silicone
     c. Characteristics
     d. Preparing/mixing
- C. Special considerations in taking impressions
  1. Anatomy
  2. Pathology
- D. Retraction methods

(10%) III. PATIENT MANAGEMENT TECHNIQUES

(10%) IV. BITE/OCCLUSAL REGISTRATIONS

(10%) V. INFECTION CONTROL/OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) PROTOCOL

Dental Assisting National Board, Inc.

Measuring Dental Assisting Excellence®

Impressions (IM)

Suggested References for Exam Preparation

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2. Phinney, Donna J., and Judy H. Halstead. *Dental Assisting: A Comprehensive Approach.* 3rd and 4th ed. Clifton Park, NY: Delmar, 2008 and 2013.
3. Hatrick, Carol D. and W. S. Eakle. *Dental Materials: Clinical Applications for Dental Assistants and Dental Hygienists.* 3rd ed. St. Louis, MO: Elsevier/Saunders, 2016.
4. Powers, John M., and John C. Wataha. *Dental Materials: Properties and Manipulation.* 10th ed. St. Louis, MO: Elsevier/Mosby, 2013.
5. Bird, Doni L., and Debbie S. Robinson. *Essentials of Dental Assisting.* 4th and 5th ed. St. Louis, MO: Elsevier/Saunders, 2007 and 2013.
6. Wilkins, Esther M. *Clinical Practice of the Dental Hygienist.* 10th and 11th ed. Philadelphia, PA: Lippincott, 2008 and 2013.
7. Miller, Chris H. *Infection Control and Management of Hazardous Materials for the Dental Team.* 5th ed. St. Louis, MO: Elsevier/Mosby, 2014.

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THE OFFICIAL DANB AFFILIATE

The DALE Foundation
Interactive E-Learning for
Oral Healthcare Professionals

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Chicago, IL 60611-3985

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1-312-642-1475 Fax
www.dalefoundation.org
email@dalefoundation.org

September 11, 2015

Nevada State Board of Dental Examiners
Attn: Angelica Bejar, Public Information -Travel Administrator
6010 S. Rainbow Blvd., A-I
Las Vegas, Nevada 89118,
nsbde@nsbde.nv.gov

Dear Distinguished Members of the Nevada State Board of Dental Examiners:

I am writing in response to the Notice of Public Workshop and Request for Comments that the Board published in preparation for a public workshop to be held Sept. 18, 2015. On behalf of the Dental Auxiliary Learning and Education Foundation (the DALE Foundation), I would like to provide the Board with information that may be of interest in connection with the proposed revisions that will be discussed at that workshop.

First, allow me to provide some background information about the DALE Foundation. The DALE Foundation, the official affiliate of the Dental Assisting National Board, Inc. (DANB), offers interactive online educational courses and resources to advance the dental team and prepare dental auxiliaries for DANB certification. The DALE Foundation has received Recognized Provider status from the American Dental Association's Continuing Education Recognition Program (ADA CERP) and is an Approved Program Provider through the Academy of General Dentistry's Program Approval for Continuing Education (AGD PACE).

One of the regulatory revisions that will be considered at the upcoming workshop is a proposal to allow dental assistants in Nevada to take radiographs prior to the dentist's examination of the patient. As the Board considers this proposal, the Board's discussion might also include information about what types of education and training are available to dental assistants who take radiographs prior to the dentist's examination of the patient. Current regulations require a dentist to attest that each dental assistant who performs radiography has received adequate instruction in radiographic procedures.

In a large state like Nevada, where the population is densest in a few metropolitan areas, it may be difficult for dental assistants outside of these areas to locate in-person courses that provide adequate instruction in radiography.

The DALE Foundation currently offers a self-paced online course – the DANB® RHS® Review course – that provides an opportunity for dental assistants to learn the essential information necessary to perform dental radiography procedures in a dental office without attending an in-person course. The DALE Foundation's DANB RHS Review course is an interactive online learning experience broken down into 13 course modules. The course incorporates learner assessments, which allow each learner to check his or her progress, and concludes with a post-assessment. The DANB RHS Review course may also be used as a tool to prepare for DANB's Radiation Health and Safety (RHS) exam. The price of the course is $130.00, which provides the learner with six months of unlimited access.

The DALE Foundation's DANB RHS Review course currently meets part of the regulatory requirements for dental assistants to qualify to perform radiography procedures in Virginia, Kentucky, Ohio and Oregon. The DALE Foundation is recognized as an accepted provider of continuing education by the boards of dentistry in California, Iowa and Maryland.

The DALE Foundation's DANB RHS Review course addresses these learning objectives:

- Identify major anatomical landmarks of the teeth, jaw, oral cavity and adjacent structures of the skull
- Understand basic radiation biology concepts
- Practice radiation safety procedures for both operator and patients
- Operate radiographic exposure equipment
- Catch and correct common intraoral and extraoral radiographic exposure errors
- Use radiographic processing equipment and digital equipment
- Detect and fix common radiographic processing errors
- Mount and label dental radiographs
- Apply effective infection control techniques
- Implement necessary Quality Assurance procedures

Additional information about the course, including a video course demo and learner reviews, are available on the DALE Foundation's website at http://www.dalefoundation.org/Courses-And-Study-Aids/Product-Catalog-Search/DANB-RHS-Review.

If the Board is contemplating requiring or recommending, either now or in the future, any specific course of study for dental assistants who perform radiography procedures in Nevada, I encourage you to contact me so that I can provide selected Board members with complimentary access to the DALE Foundation's DANB RHS Review course for evaluation purposes.

If you have any questions about the DALE Foundation's DANB RHS Review course or any other product or service of the DALE Foundation, please don't hesitate to contact me at jvandellen@dalefoundation.org or 1-877-510-3253, ext. 273.

Sincerely,

Jim Van Dellen
Director, Education and Research

Cc: Cynthia C. Durley, M.Ed., MBA, Executive Director, the DALE Foundation
Katherine Landsberg, Assistant Director, Government Relations, the DALE Foundation

Public Comment Submitted
By *General Public*

Nevada State Board of Dental Examiners
6010 S. Rainbow Blvd, A-1
Las Vegas, Nevada 89118

Received
SEP 11 2015
NSBDE

Attn: Angelica Bejar,
Public Information-Travel Administrator

9-9-2015

Dear Nevada State Board of Dental Examiners Members,

I write in support of the proposed changes to NAC 631.210. The proposed changes will afford greater efficiency in the use of the dental practice resources while maintaining the highest level of patient safety. By allowing dental hygienists to 1) expose radiographs, 2) assess the oral health of patients through medical and dental histories, radiographs, risk assessments and intraoral and extraoral procedures that analyze and identify the oral health needs and problems of patients, 3) develop a dental hygiene care plan to address the oral health needs and problems of patients described in subparagraph (I), and 4) take impressions for the preparation of diagnostic models prior to the dentist's examination of the patient, is a logical way to utilize the skills all hygienists are required to be competent to perform. Having radiographs and assessment indices completed and chairside prior to examination will keep patients safe because all the necessary components to appropriate diagnosis will be present from the start. It will make the dentist's task of diagnosis more efficient, and will ultimately result in smoother, better practice management.

The other changes proposed that would affect the amount of supervision required by dental hygienists for the administration of local anesthesia and nitrous oxide will improve delivery of dental hygiene services to the public and afford greater public access with full patient protection. It would allow the dental hygiene schedule to be expanded to times when the dentist is not present in the office, which might be more convenient for the patient, and would ultimately increase the efficiency and services available to the patients of record who benefit from local anesthesia during dental hygiene procedures. Because hygienists are fully trained in emergency procedures in the dental office as part of the dental hygiene curriculum and licensure requirements, these changes pose no increased risk to patient safety. The ultimate effect would be an improvement in the services and access afforded the patients, and concurrently improve efficiency in the use of the dental practice resources.

The proposed changes to NAC 631.210 are logical and safe improvements to the practice of dental hygiene in Nevada. I fully support the proposed changes to NAC 631.210.

Sincerely,

Im a patient.

Tong S Seok

Nevada State Board of Dental Examiners
6010 S. Rainbow Blvd, A-1
Las Vegas, Nevada 89118

Attn: Angelica Bejar,
Public Information-Travel Administrator

9-9-2015

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The proposed changes to NAC 631.210 are logical and safe improvements to the practice of dental hygiene in Nevada. I fully support the proposed changes to NAC 631.210.

Sincerely,

I'm a patient

Michael Sekoian

Nevada State Board of Dental Examiners
6010 S. Rainbow Blvd, A-1
Las Vegas, Nevada 89118

Attn: Angelica Bejar,
Public Information-Travel Administrator

09/08/2015

Received
SEP 11 2015
NSBDE

Dear Nevada State Board of Dental Examiners Members,

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The proposed changes to NAC 631.210 are logical and safe improvements to the practice of dental hygiene in Nevada. I fully support the proposed changes to NAC 631.210.

Sincerely,

Ashley Vargas (patient)
Ashley Vargas

Nevada State Board of Dental Examiners
6010 S. Rainbow Blvd, A-1
Las Vegas, Nevada 89118

Received
SEP 11 2015
NSBDE

Attn: Angelica Bejar,
Public Information-Travel Administrator

9.9.15

Dear Nevada State Board of Dental Examiners Members,

I write in support of the proposed changes to NAC 631.210. The proposed changes will afford greater efficiency in the use of the dental practice resources while maintaining the highest level of patient safety. By allowing dental hygienists to 1) expose radiographs, 2) assess the oral health of patients through medical and dental histories, radiographs, risk assessments and intraoral and extraoral procedures that analyze and identify the oral health needs and problems of patients, 3) develop a dental hygiene care plan to address the oral health needs and problems of patients described in subparagraph (I), and 4) take impressions for the preparation of diagnostic models prior to the dentist's examination of the patient, is a logical way to utilize the skills all hygienists are required to be competent to perform. Having radiographs and assessment indices completed and chairside prior to examination will keep patients safe because all the necessary components to appropriate diagnosis will be present from the start. It will make the dentist's task of diagnosis more efficient, and will ultimately result in smoother, better practice management.

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The proposed changes to NAC 631.210 are logical and safe improvements to the practice of dental hygiene in Nevada. I fully support the proposed changes to NAC 631.210.

Sincerely,

Vivian Rivera
patient of record.

Nevada State Board of Dental Examiners
6010 S. Rainbow Blvd, A-1
Las Vegas, Nevada 89118

Received
SEP 11 2015
NSBDE

Attn: Angelica Bejar,
Public Information-Travel Administrator

9/9/2015

Dear Nevada State Board of Dental Examiners Members,

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The proposed changes to NAC 631.210 are logical and safe improvements to the practice of dental hygiene in Nevada. I fully support the proposed changes to NAC 631.210.

Sincerely,

I'm a patient.

Karo Davtyan

Nevada State Board of Dental Examiners
6010 S. Rainbow Blvd, A-1
Las Vegas, Nevada 89118

Received
SEP 1 1 2015
NSBDE

Attn: Angelica Bejar,
Public Information-Travel Administrator

9-9-2015

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The proposed changes to NAC 631.210 are logical and safe improvements to the practice of dental hygiene in Nevada. I fully support the proposed changes to NAC 631.210.

Sincerely, Jong Seok

I'm a patient.

Nevada State Board of Dental Examiners
6010 S. Rainbow Blvd, A-1
Las Vegas, Nevada 89118

Received
SEP 11 2015
NSBDE

Attn: Angelica Bejar,
Public Information-Travel Administrator

9-9-2015

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The proposed changes to NAC 631.210 are logical and safe improvements to the practice of dental hygiene in Nevada. I fully support the proposed changes to NAC 631.210.

Sincerely,

Angella Jaramillo

I am a patient.

Nevada State Board of Dental Examiners
6010 S. Rainbow Blvd, A-1
Las Vegas, Nevada 89118

Received
SEP 1 1 2015
NSBDE

Attn: Angelica Bejar,
Public Information-Travel Administrator

9/8/15

Dear Nevada State Board of Dental Examiners Members,

I write in support of the proposed changes to NAC 631.210. The proposed changes will afford greater efficiency in the use of the dental practice resources while maintaining the highest level of patient safety. By allowing dental hygienists to 1) expose radiographs, 2) assess the oral health of patients through medical and dental histories, radiographs, risk assessments and intraoral and extraoral procedures that analyze and identify the oral health needs and problems of patients, 3) develop a dental hygiene care plan to address the oral health needs and problems of patients described in subparagraph (I), and 4) take impressions for the preparation of diagnostic models prior to the dentist's examination of the patient, is a logical way to utilize the skills all hygienists are required to be competent to perform. Having radiographs and assessment indices completed and chairside prior to examination will keep patients safe because all the necessary components to appropriate diagnosis will be present from the start. It will make the dentist's task of diagnosis more efficient, and will ultimately result in smoother, better practice management.

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The proposed changes to NAC 631.210 are logical and safe improvements to the practice of dental hygiene in Nevada. I fully support the proposed changes to NAC 631.210.

Sincerely,

Patient

Nevada State Board of Dental Examiners
6010 S. Rainbow Blvd, A-1
Las Vegas, Nevada 89118

Attn: Angelica Bejar,
Public Information-Travel Administrator
9/8/15

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The proposed changes to NAC 631.210 are logical and safe improvements to the practice of dental hygiene in Nevada. I fully support the proposed changes to NAC 631.210.

Sincerely,

Nicole
patient of Record

Nevada State Board of Dental Examiners
6010 S. Rainbow Blvd, A-1
Las Vegas, Nevada 89118

Received
SEP 11 2015
NSBDE

Attn: Angelica Bejar,
Public Information-Travel Administrator

9/8/2015

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Sincerely,

Lorene Moffin
Patient

Nevada State Board of Dental Examiners
6010 S. Rainbow Blvd, A-1
Las Vegas, Nevada 89118

Received
SEP 11 2015
NSBDE

Attn: Angelica Bejar,
Public Information-Travel Administrator

9/8/15

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The proposed changes to NAC 631.210 are logical and safe improvements to the practice of dental hygiene in Nevada. I fully support the proposed changes to NAC 631.210.

Sincerely,

Karin J. Martin

Karin J. Martin- Patient

Public Comment regarding ANESTHESIA Regulations

September 10, 2015

Nevada State Board of Dental Examiners
6010 S. Rainbow Blvd., Bldg A, Ste 1
Las Vegas, NV 89118

Re: Proposed Anesthesia Regulations NAC 631.003; NAC 631.004 and NAC 631.2211-NAC 631.2256

Members of the Nevada State Board of Dental Examiners,

It has been brought to the attention of the leadership of the Nevada Academy of Pediatric Dentistry (NVAPD) and the Western Society of Pediatric Dentistry (WSPD) the proposed changes in anesthesia regulations now being considered in Nevada. There are a number of NVAPD and WSPD members that will be directly impacted by these changes. We feel that a number of the proposed changes are unnecessary and overly burdensome for pediatric and other dentists using moderate sedation to provide care.

We strongly encourage the Board to consider the guidelines established by the American Academy of Pediatric Dentistry (AAPD), *Guideline for Monitoring and Management of Pediatric Patients During and After Sedation for Diagnostic and Therapeutic Procedures*, hereafter referred to as "guideline." These guidelines are endorsed by the American Academy of Pediatrics (AAP) as well as supported and referenced by the American Dental Association (ADA) in their *Guidelines for the Use of Sedation and General Anesthesia by Dentists.*

When considering minimal sedation, the guideline states "Children who have received minimal sedation generally will not require more than observation and intermittent assessment of their level of sedation." We thus encourage the Board to keep the regulations for minimal sedation separate and apart from the regulations for moderate sedation. NAC 631.2211 "Scope" excludes the use of nitrous oxide and "oral medication...administered...to relieve anxiety" from these regulations, but the guideline considers these to be a form of mild sedation. We deem it necessary to include language pertinent to the use of what would be considered minimal sedation, such as valium or nitrous oxide. The regulations should specify requirements for the use of minimal sedation which are clearly different from other levels of sedation. As written in the proposed changes, there is no separation of minimal and moderate sedation. We also recommend that the Board not require a site inspection for the use of minimal sedation.

NAC 631.2213 "qualifications of applicants" section 2 (2) requires providers of minimal sedation to "hold current certification in either ACLS or PALS." For a level of minimal sedation we recommend providers be required to be certified in BLS, but feel additional ACLS or PALS training should be encouraged, not required.

Under the proposed changes NAC 631.2227, section 8 (c), (d) and (h), providers are required to have on site a "Laryngoscope with appropriate size blades," "intubation tubes multiple sizes" and a "Pediatric Bite Block." The use of a laryngoscope to intubate a patient requires significant additional training beyond the scope of what is deemed necessary to safely administer moderate sedation. Requiring providers to maintain this equipment who have not been properly trained in

its use does not increase safety or the likelihood of a better outcome with an adverse event. To the contrary, it has the potential to result in a worse outcome should an untrained provider attempt to intubate a patient. Additionally, a bite block is not an instrument for use during an emergency and we are unaware of any type of emergency training in which it is taught to use a bite block. We therefore recommend removing section 8 (c), (d) and (h).

Per the guideline AND the proposed changes, an EKG monitor on a moderately sedated patient is not necessary or recommended. Yet the proposed changes will require practitioners who plan on using moderate sedation to maintain emergency drugs, the use of which require a diagnosis of the cardiac rhythm only attainable through an EKG. These drugs are noted in the proposed changes NAC 631.2231, section 2. We therefore encourage the board to remove from the proposed changes for moderate sedation the following medications: Adenosine, Amiodarone, Magnesium Sulfate, and Procainamide. It is understood that PALS and ACLS recommend these medications in their algorithms, but the justification for requiring PALS of those providing moderate sedation to the pediatric population is airway management. Recommended medications for moderate sedation are epinephrine, bronchodilator, appropriate drug antagonists, antihistaminic, anticholinergic, anticonvulsant, oxygen, dextrose or other antihypoglycemic and ammonia.

Some states, such as California, have a pediatric moderate sedation permit and a separate adult moderate sedation permit. We request the Board consider creating a pediatric moderate sedation permit for children under the age of 13. This separation allows specificity in equipment and drugs for adults and pediatric patients. It will also allow specific requirements for qualifications and training and be more in line with current ADA guidelines for sedation which separates recommendations between adults and pediatric patients.

We respectfully request, if it is hasn't already been done, that a committee be established to review and revise the proposed changes. We additionally request this committee include a representative number of Pediatric Dentists who hold sedation permits. We are willing to provide names of possible committee members if desired.

We appreciate the attention of the Board Members to this statement and our recommendations. We applaud the efforts of the Board to bring the terminology and regulations more in line with current standards. We look forward to working with the Board to help ensure a safe and practical environment for providers and patients alike.

Respectfully,

Nevada Academy of Pediatric Dentistry
Western Society of Pediatric Dentistry

Submitted by: Dr. Ashley Hoban, President NVAPD, and Dr. Cody Hughes, NV WSPD Trustee

SUMMERLIN
pediatric dentistry

Ashley E. Hoban, DMD
653 N. Town Center Dr. • Suite 104 • Las Vegas NV 89144
office: 702.838.9013 **fax:** 702.838.9157

September 10, 2015

Nevada State Board of Dental Examiners
6010 S. Rainbow Blvd., Bldg A, Ste 1
Las Vegas, NV 89118

Re: Proposed Anesthesia Regulations NAC 631.003; NAC 631.004 and NAC 631.2211-NAC 631.2256

Members of the Nevada State Board of Dental Examiners,

The Nevada Academy of Pediatric Dentistry (NVAPD) and the Western Society of Pediatric Dentistry (WSPD) have reviewed the proposed changes in sedation and anesthesia regulations now being considered in Nevada. NVAPD and WSPD members will be directly impacted by these changes. In our opinion, sections of the proposed changes are unnecessary and overly burdensome for pediatric and other dentists using minimal and moderate sedation to provide care. These changes have not been shown to improve patient safety or outcomes at these levels of sedation and question if any studies in EBM show efficacy of the proposed changes.

We strongly encourage the Board to consider the guidelines established by the American Academy of Pediatric Dentistry (AAPD), *Guideline for Monitoring and Management of Pediatric Patients During and After Sedation for Diagnostic and Therapeutic Procedures*, hereafter referred to as "guidelines." These guidelines were jointly developed by the AAPD, the American Academy of Pediatrics (AAP) and the American Society of Anesthesiology (ASA) and are endorsed by all. The guidelines are supported and referenced by the American Dental Association (ADA) in their *Guidelines for the Use of Sedation and General Anesthesia by Dentists* 2008.

When considering minimal sedation, the guidelines state "Children who have received minimal sedation generally will not require more than observation and intermittent assessment of their level of sedation." We thus encourage the Board to keep the regulations for minimal sedation separate and apart from the regulations for moderate sedation. NAC 631.2211 "Scope" excludes the use of nitrous oxide/oxygen inhalation sedation and "oral medication...administered...to relieve anxiety" from these regulations, but the guideline considers these to be a form of mild sedation. We deem it necessary to include language pertinent to the use of what would be considered minimal sedation, such as a single benzodiazepine in combination with or separate from nitrous oxide/oxygen inhalation sedation. The regulations should specify requirements for the use of minimal sedation which are clearly different from other levels of sedation as well as the accepted definitions of minimal sedation and moderate sedation. As written in the proposed changes, there is no separation of minimal and moderate sedation. We also recommend that the Board not require a site inspection for the use of minimal sedation. A valid reason should be given for the necessity of a site inspection for moderate sedation.

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NAC 631.2213 "qualifications of applicants" section 2 (2) requires providers of minimal sedation to "hold current certification in either ACLS or PALS." For a level of minimal sedation we recommend providers be required to be certified in healthcare provider BLS, but feel additional ACLS or PALS training should be encouraged, not required.

Under the proposed changes NAC 631.2227, section 8 (c), (d) and (h), providers are required to have on site a "Laryngoscope with appropriate size blades," "intubation tubes multiple sizes" and a "Pediatric Bite Block." The use of a laryngoscope to intubate a patient requires significant additional training beyond the scope of what is deemed necessary to safely administer moderate sedation. Requiring providers to maintain this equipment who have not been properly trained in its use does not increase safety or the likelihood of a better outcome with an adverse event. To the contrary, it has the potential to result in a worse outcome should an untrained provider attempt to intubate a patient. The accepted concept regarding advanced airway management is the use of a laryngeal mask airway, a far safer and easier to use tool in maintaining a patent airway during RESCUE from an adverse event. Additionally, a bite block is not an instrument for use during an emergency and we are unaware of any emergency training in which use of this is taught. We therefore recommend removing section 8 (c), (d) and (h).

Per the guidelines and the proposed changes, monitoring with an EKG on a moderately sedated patient is not necessary nor recommended. The proposed changes will require practitioners who plan on using moderate sedation to maintain emergency drugs such as Magnesium Sulfate and Amiodarone, the use of which require a diagnosis of the cardiac arrhythmia only attainable through an EKG. These drugs are noted in the proposed changes NAC 631.2231, section 2. We therefore encourage the board to remove from the proposed changes for moderate sedation the following medications: Adenosine, Amiodarone, Magnesium Sulfate, and Procainamide. It is understood that PALS and ACLS recommend these medications in their algorithms, but the justification for requiring PALS of those providing moderate sedation to the pediatric population is airway management and the ability to RESCUE a patient during an adverse event (see articles by Charles Cote, MD, pediatric anesthesiologist as referenced in the AAPD guidelines). Recommended medications for moderate sedation are epinephrine, bronchodilator, appropriate drug antagonists, antihistaminic, anticholinergic, anticonvulsant, oxygen, dextrose or other antihypoglycemic and ammonia.

Some states, such as California, have a pediatric moderate sedation permit and a separate adult moderate sedation permit. We request the Board consider creating a pediatric moderate sedation permit for children under the age of 12 and under. The AAPD guidelines refer to patients generally 18 and under and the ADA guidelines defer to the ADA guidelines for patients 12 and under. This separation allows specificity in equipment and drugs for adults and pediatric patients. It will also allow specific requirements for qualifications and training and be more in line with current ADA guidelines for sedation which separates recommendations between adults and pediatric patients.

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We respectfully request prior to implementing any changes that a committee be established to review and revise the proposed changes on which sit expert representatives of the affected communities including Pediatric Dentists who have sedation permits. We will provide names of possible committee members if desired.

We appreciate the attention of the Board Members to this statement and our recommendations. We applaud the efforts of the Board to bring the terminology and regulations more in line with current standards. We look forward to working with the Board to help ensure a safe and practical environment for providers and patients alike.

Respectfully,

Nevada Academy of Pediatric Dentistry
Western Society of Pediatric Dentistry

Submitted by: Dr. Ashley Hoban, President NVAPD, and Dr. Cody Hughes, NV WSPD Trustee

Guideline on Use of Nitrous Oxide for Pediatric Dental Patients

Originating Council
Council on Clinical Affairs

Review Council
Council on Clinical Affairs

Adopted
2005

Revised
2009, 2013

Purpose

The American Academy of Pediatric Dentistry (AAPD) recognizes nitrous oxide/oxygen inhalation as a safe and effective technique to reduce anxiety, produce analgesia, and enhance effective communication between a patient and health care provider. The need to diagnose and treat, as well as the safety of the patient and practitioner, should be considered before using nitrous oxide. By producing this guideline, the AAPD intends to assist the dental profession in developing appropriate practices in the use of nitrous oxide/oxygen analgesia/anxiolysis for pediatric patients.

Methods

This document is an update of the previous guideline revised in 2009. The revision is based on a review of the current dental and medical literature related to nitrous oxide use. An electronic search was conducted using PubMed® with the following parameters: Terms "nitrous oxide", "analgesia", "anxiolysis", "behavior management", and "dental treatment"; Fields: all; Limits: within the last 10 years, humans, English, and clinical trials. Forty articles met these criteria, and papers were added to the references from the previous document. When data did not appear sufficient or were inconclusive, recommendations were based upon expert and/or consensus opinion by experienced researchers and clinicians.

Background

Dentists have expertise in providing anxiety and pain control for their patients. While anxiety and pain can be modified by psychological techniques, in many instances pharmacological approaches are required.[1] Analgesia/anxiolysis is defined as diminution or elimination of pain and anxiety in a conscious patient.[2] The patient responds normally to verbal commands. All vital signs are stable, there is no significant risk of losing protective reflexes, and the patient is able to return to preprocedure mobility. In children, analgesia/anxiolysis may expedite the delivery of procedures that are not particularly uncomfortable, but require that the patient not move.[2] It also may allow the patient to tolerate unpleasant procedures by reducing or relieving anxiety, discomfort, or pain. The outcome of pharmacological approaches is variable and depends upon each patient's response to various drugs. The clinical effect of nitrous oxide/oxygen inhalation, however, is more predictable among the majority of the population.

Nitrous oxide is a colorless and virtually odorless gas with a faint, sweet smell. It is an effective analgesic/anxiolytic agent causing central nervous system (CNS) depression and euphoria with little effect on the respiratory system.[3,4] Nitrous oxide has multiple mechanisms of action. The analgesic effect of nitrous oxide appears to be initiated by neuronal release of endogeneous opioid peptides with subsequent activation of opioid receptors and descending Gamma-aminobutyric acid type A (GABAA) receptors and noradrenergic pathways that modulate nociceptive processing at the spinal level. The anxiolytic effect involves activation of the GABAA receptor either directly or indirectly through the benzodiazepine binding site.[5,6] Nitrous oxide has rapid uptake, being absorbed quickly from the alveoli and held in a simple solution in the serum. It is relatively insoluble, passing down a gradient into other tissues and cells in the body, such as the CNS. It is excreted quickly from the lungs. As nitrous oxide is 34 times more soluble than nitrogen in blood, diffusion hypoxia may occur. Studies[7-9] have shown that children desaturate more rapidly than adolescents, and administering 100 percent oxygen to the patient once the nitrous oxide in a closed system has been terminated is important.[7] Nitrous oxide causes minor depression in cardiac output while peripheral resistance is slightly increased, thereby maintaining the blood pressure.[3] This is of particular advantage in treating patients with cerebrovascular system disorders.

Nitrous oxide is absorbed rapidly, allowing for both rapid onset and recovery (two to three minutes). It causes minimal impairment of any reflexes, thus protecting the cough reflex.[3] It exhibits a superior safety profile with no recorded fatalities or cases of serious morbidity when used within recommended

concentrations.[10-13] Studies have reported negative outcomes associated with use of nitrous oxide greater than 50 percent and as an anesthetic during major surgery.[14,15] Although rare, silent regurgitation and subsequent aspiration need to be considered with nitrous oxide/oxygen sedation. The concern lies in whether pharyneal-laryngeal reflexes remain intact. This problem can be avoided by not allowing the patient to go into an unconscious state.[16]

The decision to use nitrous oxide/oxygen analgesia/anxiolysis must take into consideration alternative behavioral guidance modalities, the patient's dental needs, the effect on the quality of dental care, the patient's emotional development, and the patient's physical considerations. Nitrous oxide generally is acceptable to children and can be titrated easily. Most children are enthusiastic about the administration of nitrous oxide/oxygen; many children report dreaming or being on a "space-ride".[16] For some patients, however, the feeling of "losing control" may be troubling and claustrophobic patients may find the nasal hood confining and unpleasant.[17]

Nitrous oxide has been associated with bioenvironmental concerns because of its contribution to the greenhouse effect. Nitrous oxide is emitted naturally by bacteria in soils and oceans; it is produced by humans through the burning of fossil fuels and forests and the agricultural practices of soil cultivation and nitrogen fertilization. Altogether, nitrous oxide contributes about five percent to the greenhouse effect.[18,19] Only a small fraction of this five percent (0.35 to two percent), however, is actually the result of combined medical and dental applications of nitrous oxide gas.[19]

The objectives of nitrous oxide/oxygen inhalation include:

1. Reduce or eliminate anxiety.
2. Reduce untoward movement and reaction to dental treatment.
3. Enhance communication and patient cooperation.
4. Raise the pain reaction threshold.
5. Increase tolerance for longer appointments.
6. Aid in treatment of the mentally/physically disabled or medically compromised patient.
7. Reduce gagging.
8. Potentiate the effect of sedatives.

Disadvantages of nitrous oxide/oxygen inhalation may include:[3]

1. Lack of potency.
2. Dependant largely on psychological reassurance.
3. Interference of the nasal hood with injection to anterior maxillary region.
4. Patient must be able to breathe through the nose.
5. Nitrous oxide pollution and potential occupational exposure health hazards.

Recommendations

Indications for use of nitrous oxide/oxygen analgesia/anxiolysis include:

1. A fearful, anxious, or obstreperous patient.
2. Certain patients with special health care needs.
3. A patient whose gag reflex interferes with dental care.
4. A patient for whom profound local anesthesia cannot be obtained.
5. A cooperative child undergoing a lengthy dental procedure.

Review of the patient's medical history should be performed prior to the decision to use nitrous oxide/oxygen analgesia/anxiolysis. This assessment should include:

1. Allergies and previous allergic or adverse drug reactions.
2. Current medications including dose, time, route, and site of administration.
3. Diseases, disorders, or physical abnormalities and pregnancy status.
4. Previous hospitalization to include the date and purpose.
5. Recent illnesses (eg, cold or congestion) that may compromise the airway.

Contraindications for use of nitrous oxide/oxygen inhalation may include:

1. Some chronic obstructive pulmonary diseases.[20]
2. Severe emotional disturbances or drug-related dependencies.[21]
3. First trimester of pregnancy.[22]
4. Treatment with bleomycin sulfate.[23]
5. Methylenetetrahydrofolate reductase deficiency.[24]
6. Cobalamin deficiency.[6]

Whenever possible, appropriate medical specialists should be consulted before administering analgesic/anxiolytic agents to patients with significant underlying medical conditions (eg, severe obstructive pulmonary disease, congestive heart failure, sickle cell disease[25], acute otitis media, recent tympanic membrane graft[26], acute severe head injury[27]).

Technique of nitrous oxide/oxygen administration

Nitrous oxide/oxygen must be administered only by appropriately licensed individuals, or under the direct supervision thereof, according to state law. The practitioner responsible for the treatment of the patient and/or the administration of analgesic/anxiolytic agents must be trained in the use of such agents and techniques and appropriate emergency response.

Selection of an appropriately sized nasal hood should be made. A flow rate of five to six L/min generally is acceptable to most patients. The flow rate can be adjusted after observation of the reservoir bag. The bag should pulsate gently with each breath and should not be either over- or underinflated. Introduction of 100 percent oxygen for one to two minutes followed by titration of nitrous oxide in 10 percent intervals is recommended. During nitrous oxide/oxygen analgesia/anxiolysis, the concentration of nitrous oxide should not routinely exceed 50 percent. Studies have demonstrated that gas concentrations dispensed by the flow meter vary significantly from the end-expired alveolar gas concentrations; it is the later that is

responsible for the clinical effects.[28,29] To achieve sedation, the scavenging vacuum should not be so strong as to prevent adequate ventilation of the lungs with nitrous oxide.[30] A review of records of patients undergoing nitrous oxide-oxygen inhalation sedation demonstrate that the typical patient requires from 30 to 40 percent nitrous oxide to achieve ideal sedation.[31] Nitrous oxide concentration may be decreased during easier procedures (eg, restorations) and increased during more stimulating ones (eg, extraction, injection of local anesthetic). Side effects such as nausea and vomiting are more likely to be observed when titration is not employed.[31] During treatment, it is important to continue the visual monitoring of the patient's respiratory rate and level of consciousness. The effects of nitrous oxide largely are dependent on psychological reassurance. Therefore, it is important to continue traditional behavior guidance techniques during treatment. Once the nitrous oxide flow is terminated, 100 percent oxygen should be delivered for five minutes.[21] The patient must return to pretreatment responsiveness before discharge.

Monitoring

The response of patients to commands during procedures performed with analgesia/anxiolysis serves as a guide to their level of consciousness. Clinical observation of the patient must be performed during any dental procedure. During nitrous oxide/oxygen analgesia/anxiolysis, continual clinical observation of the patient's responsiveness, color, and respiratory rate and rhythm must be performed. Spoken responses provide an indication that the patient is breathing.[2] If any other pharmacologic agent is used in addition to nitrous oxide/oxygen and a local anesthetic, monitoring guidelines for the appropriate level of sedation must be followed.[32]

Adverse effects of nitrous oxide/oxygen inhalation

Nitrous oxide/oxygen analgesia/anxiolysis has an excellent safety record. When administered by trained personnel on carefully selected patients with appropriate equipment and technique, nitrous oxide is a safe and effective agent for providing pharmacological guidance of behavior in children. Acute and chronic adverse effects of nitrous oxide on the patient are rare.[33] Nausea and vomiting are the most common adverse effects, occurring in 0.5 percent of patients.[34] A higher incidence is noted with longer administration of nitrous oxide/oxygen, fluctuations in nitrous oxide levels, and increased concentrations of nitrous oxide.[3] Fasting is not required for patients undergoing nitrous oxide analgesia/anxiolysis. The practitioner, however, may recommend that only a light meal be consumed in the two hours prior to the administration of nitrous oxide.[35] Diffusion hypoxia can occur as a result of rapid release of nitrous oxide from the blood stream into the alveoli, thereby diluting the concentration of oxygen. This may lead to headache and disorientation and can be avoided by administering 100 percent oxygen after nitrous oxide has been discontinued.[3]

Documentation

Informed consent must be obtained from the parent and documented in the patient's record prior to administration of nitrous oxide/oxygen. The practitioner should provide instructions to the parent regarding pretreatment dietary precautions, if indicated. In addition, the patient's record should include indication for use of nitrous oxide/oxygen inhalation, nitrous oxide dosage (ie, percent nitrous oxide/oxygen and/or flow rate), duration of the procedure, and post treatment oxygenation procedure.

Facilities/personnel/equipment

All newly installed facilities for delivering nitrous oxide/oxygen must be checked for proper gas delivery and fail-safe function prior to use. Inhalation equipment must have the capacity for delivering 100 percent, and never less than 30 percent, oxygen concentration at a flow rate appropriate to the child's size. Additionally, inhalation equipment must have a fail-safe system that is checked and calibrated regularly according to the practitioner's state laws and regulations.[15] If nitrous oxide/oxygen delivery equipment capable of delivering more than 70 percent nitrous oxide and less than 30 percent oxygen is used, an inline oxygen analyzer must be used. The equipment must have an appropriate scavenging system to minimize room air contamination and occupational risk.

The practitioner who utilizes nitrous oxide/oxygen analgesia/anxiolysis for a pediatric dental patient shall possess appropriate training and skills and have available the proper facilities, personnel, and equipment to manage any reasonably foreseeable emergency. Training and certification in basic life support are required for all clinical personnel. These individuals should participate in periodic review of the office's emergency protocol, the emergency drug cart, and simulated exercises to assure proper emergency management response.

An emergency cart (kit) must be readily accessible. Emergency equipment must be able to accommodate children of all ages and sizes. It should include equipment to resuscitate a nonbreathing, unconscious patient and provide continuous support until trained emergency personnel arrive. A positive-pressure oxygen delivery system capable of administering greater than 90 percent oxygen at a 10 L/min flow for at least 60 minutes (650 L, "E" cylinder) must be available. When a self-inflating bag valve mask device is used for delivering positive pressure oxygen, a 15 L/min flow is recommended. There should be documentation that all emergency equipment and drugs are checked and maintained on a regularly scheduled basis.[32] Where state law mandates equipment and facilities, such statutes should supersede this guideline.[32]

Occupational safety

In the medical literature, long-term exposure to nitrous oxide used as a general anesthetic has been linked to bone marrow suppression and reproductive system disturbances.[6,36-38] In an effort to reduce occupational health hazards associated with nitrous oxide, the AAPD recommends exposure to ambient

nitrous oxide be minimized through the use of effective scavenging systems and periodic evaluation and maintenance of the delivery and scavenging systems.[39,40]

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Management of Medical Emergencies

For all emergencies

1. Discontinue dental treatment
2. Call for assistance / someone to bring oxygen and emergency kit
3. Position patient; ensure open and unobstructed airway
4. Monitor vital signs
5. Be prepared to support respiration, support circulation, provide cardiopulmonary resuscitation (CPR), and call for emergency medical services

Condition	Signs and symptoms	Treatment	Drug dosage	Drug delivery*
Allergic reaction (mild or delayed)	Hives; itching; edema; erythema–skin, mucosa conjuctiva	1. Discontinue all sources of allergy-causing substances 2. Administer diphenhydramine	Diphenhydramine 1 mg/kg Child: 10-25 mg qid Adult: 25-50 mg qid[1]	Oral
Allergic reaction (sudden onset): anaphylaxis	Urticaria-itching, flushing, hives; rhinitis; wheezing/difficulty breathing; broncho-spasm; laryngeal edema; weak pulse; marked fall in blood pressure; loss of consciousness	This is a true, life-threatening emergency 1. Call for emergency medical services 2. Administer epinephrine 3. Administer oxygen 4. Monitor vital signs 5. Transport to emergency medical facility by advanced medical responders	Epinephrine 1:1000 0.01 mg/kg every 5 min until recovery or until help arrives[1,2]	IM or SubQ
Acute asthmatic attack	Shortness of breath; wheezing; coughing; tightness in chest; cyanosis; tachycardia	1. Sit patient upright or in a comfortable position 2. Administer oxygen 3. Administer bronchodilator 4. If bronchodilator is ineffective, administer epinephrine 5. Call for emergency medical services with transportation for advanced care if indicated	1. Albuterol (patient's or emergency kit inhaler) 2. Epinephrine 1:1000 0.01 mg/kg every 15 min as needed[1,2]	Inhale IM or SubQ
Local anesthetic toxicity	Light-headedness; changes in vision and/or speech; metallic taste; changes in mental status–confusion; agitation; tinnitis; tremor; seizure; tachypnea; bradycardia; unconsciousness; cardiac arrest	1. Assess and support airway, breathing, and circulation (CPR if warranted) 2. Administer oxygen 3. Monitor vital signs 4. Call for emergency medical services with transportation for advanced care if indicated	Supplemental oxygen	Mask
Local anesthetic reaction: vasoconstrictor	Anxiety; tachycardia/ palpitations; restlessness; headache; tachypnea; chest pain; cardiac arrest	1. Reassure patient 2. Assess and support airway, breathing, and circulation (CPR if warranted) 3. Administer oxygen 4. Monitor vital signs 5. Call for emergency medical services with transportation for advanced care if indicated	Supplemental oxygen	Mask
Overdose: benzodiazepine	Somnolence; confusion; diminished reflexes; respiratory depression; apnea; respiratory arrest; cardiac arrest	1. Assess and support airway, breathing, and circulation (CPR if warranted) 2. Administer oxygen 3. Monitor vital signs 4. If severe respiratory depression, establish IV access and reverse with flumazenil 5. Monitor recovery (for at least 2 hours after the last dose of flumazenil) and call for emergency medical services with transportation for advanced care if indicated	Flumazenil 0.01 - 0.02 mg/kg (maximum: 0.2 mg); may repeat at 1 min intervals not to exceed a cumulative dose of 0.05 mg/kg or 1 mg, whichever is lower)[1]	IV (if IV access is not available, may be given IM)

Tables continues on next page

For all emergencies

1. Discontinue dental treatment
2. Call for assistance/someone to bring oxygen and emergency kit
3. Position patient: ensure open and unobstructed airway
4. Monitor vital signs
5. Be prepared to support respiration, support circulation, provide cardiopulmonary resuscitation (CPR), and call for emergency medical services

Condition	Signs and symptoms	Treatment	Drug dosage	Drug delivery*
Overdose: narcotic	Decreased responsiveness; respiratory depression; respiratory arrest; cardiac arrest	1. Assess and support airway, breathing, and circulation (CPR if warranted) 2. Administer oxygen 3. Monitor vital signs 4. If severe respiratory depression, reverse with naxolone 5. Monitor recovery (for at least 2 hours after the last dose of naxolone) and call for emergency medical services with transportation for advanced care if indicated	Naxolone 0.1 mg/kg up to 2 mg.[1,2] May be repeated to maintain reversal.	IV, IM, or SubQ
Seizure	Warning aura–disorientation, blinking, or blank stare; uncontrolled muscle movements; muscle rigidity; unconsciousness; posticta phase–sleepiness, confusion, amnesia, slow recovery	1. Recline and position to prevent injury 2. Ensure open airway and adequate ventilation 3. Monitor vital signs 4. If status is epilepticus, give diazepam and call for emergency medical services with transportation for advanced care if indicated	Diazepam Child up to 5 yrs: 0.2-0.5 mg slowly every 2-5 min with maximum=5 mg Child 5 yrs and up: 1 mg every 2-5 min with maximum=10 mg[1]	IV
Syncope (fainting)	Feeling of warmth; skin pale and moist; pulse rapid initially then gets slow and weak; dizziness; hypotension; cold extremities; unconsciousness	1. Recline, feet up 2. Loosen clothing that may be binding 3. Ammonia inhales 4. Administer oxygen 5. Cold towel on back of neck 6. Monitor recovery	Ammonia in vials	Inhale

*** Legend:** **IM = Intramuscular** **IV = Intravenous** **SubQ = subcutaneous**

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Guideline for Monitoring and Management of Pediatric Patients During and After Sedation for Diagnostic and Therapeutic Procedures

Developed and Endorsed by
American Academy of Pediatrics and the American Academy of Pediatric Dentistry

Adopted
2006

Reaffirmed
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Abstract

The safe sedation of children for procedures requires a systematic approach that includes the following: no administration of sedating medication without the safety net of medical supervision, careful presedation evaluation for underlying medical or surgical conditions that would place the child at increased risk from sedating medications, appropriate fasting for elective procedures and a balance between depth of sedation and risk for those who are unable to fast because of the urgent nature of the procedure, a focused airway examination for large tonsils or anatomic airway abnormalities that might increase the potential for airway obstruction, a clear understanding of the pharmacokinetic and pharmacodynamic effects of the medications used for sedation as well as an appreciation for drug interactions, appropriate training and skills in airway management to allow rescue of the patient, age- and size-appropriate equipment for airway management and venous access, appropriate medications and reversal agents, sufficient numbers of people to both carry out the procedure and monitor the patient, appropriate physiologic monitoring during and after the procedure, a properly equipped and staffed recovery area, recovery to presedation level of consciousness before discharge from medical supervision, and appropriate discharge instructions.

Introduction

Invasive diagnostic and minor surgical procedures on pediatric patients outside the traditional operating room setting have increased in the last decade. As a consequence of this change and the increased awareness of the importance of providing analgesia and anxiolysis, the need for sedation for procedures in physician offices, dental offices, subspecialty procedure suites, imaging facilities, emergency departments, and ambulatory surgery centers also has markedly increased.[1-37] In recognition of this need for both elective and emergency use of sedation in nontraditional settings, the American Academy of Pediatrics (AAP) and American Academy of Pediatric Dentistry (AAPD) have published a series of guidelines for the monitoring and management of pediatric patients during and after sedation for a procedure.[38-42] The purpose of this updated statement is to unify the guidelines for sedation used by medical and dental practitioners, add clarifications regarding monitoring modalities, provide new information from medical and dental literature, and suggest methods for further improvement in safety and outcomes. With the revision of this document, the Joint Commission on Accreditation of Healthcare Organizations, the American Society of Anesthesiologists (ASA), the AAP, and the AAPD will use similar language to define sedation categories and the expected physiologic responses.[41-44]

This revised statement reflects the current understanding of appropriate monitoring needs both during and after sedation for a procedure.[4,5,12,19,21,22,26,45-53] The monitoring and care out-lined in this guideline may be exceeded at any time, based on the judgment of the responsible practitioner. Although intended to encourage high-quality patient care, adherence to this guideline cannot guarantee a specific patient outcome. However, structured sedation protocols designed to incorporate the principles in this document have been widely implemented and shown to reduce morbidity.[29,32-34,37,54,55] This guideline is proffered with the awareness that, regardless of the intended level of sedation or route of administration, the sedation of a pediatric patient represents a continuum and may result in respiratory depression and the loss of the patient's protective reflexes.[43,57-60]

Sedation of pediatric patients has serious associated risks, such as hypoventilation, apnea, airway obstruction, laryngospasm, and cardiopulmonary impairment.[2,6,22,45,46,54,60-69] These adverse responses during and after sedation for a diagnostic or therapeutic procedure may be minimized, but not completely eliminated, by a careful preprocedure review of the patient's underlying medical conditions and consideration of how the sedation process might affect or be affected by these conditions.[54] Appropriate drug selection for the intended procedure as well as the presence of an individual with the skills needed to rescue a patient from an adverse response are essential.

Appropriate physiologic monitoring and continuous observation by personnel not directly involved with the procedure allow for accurate and rapid diagnosis of complications and initiation of appropriate rescue interventions.[46,51,54]

The sedation of children is different from the sedation of adults. Sedation in children often is administered to control behavior to allow the safe completion of a procedure. A child's ability to control his or her own behavior to cooperate for a procedure depends both on his or her chronologic and developmental age. Often, children younger than six years and those with developmental delay require deep levels of sedation to gain control of their behavior.[57] Therefore, the need for deep sedation should be anticipated. Children in this age group are particularly vulnerable to the sedating medication's effects on respiratory drive, patency of the airway, and protective reflexes.[46] Studies have shown that it is common for children to pass from the intended level of sedation to a deeper, unintended level of sedation.[56,59,70] For older and cooperative children, other modalities, such as parental presence, hypnosis, distraction, topical local anesthetics, and guided imagery, may reduce the need for or the needed depth of pharmacologic sedation.[31,71-81]

The concept of rescue is essential to safe sedation. Practitioners of sedation must have the skills to rescue the patient from a deeper level than that intended for the procedure. For example, if the intended level of sedation is "minimal," practitioners must be able to rescue from "moderate sedation"; if the intended level of sedation is "moderate," practitioners must have the skills to rescue from "deep sedation"; if the intended level of sedation is "deep," practitioners must have the skills to rescue from a state of "general anesthesia." The ability to rescue means that practitioners must be able to recognize the various levels of sedation and have the skills necessary to provide appropriate cardiopulmonary support if needed. Sedation and anesthesia in a nonhospital environment (private physician or dental office or freestanding imaging facility) may be associated with an increased incidence of "failure to rescue" the patient should an adverse event occur, because the only backup in this venue may be to activate emergency medical services (EMS).[46,82] Rescue therapies require specific training and skills.[46,54,83,84] Maintenance of the skills needed to perform successful bag-valve-mask ventilation is essential to successfully rescue a child who has become apneic or developed airway obstruction. Familiarity with emergency airway management procedure algorithms is essential.[83-87] Practitioners should have an in-depth knowledge of the agents they intend to use and their potential complications. A number of reviews and hand-books for sedating pediatric patients are available.[32,48,55,88-93] This guideline is intended for all venues in which sedation for a procedure might be performed (hospital, surgical center, freestanding imaging facility, dental facility, or private office).

There are other guidelines for specific situations and personnel that are beyond the scope of this document. Specifically, guidelines for the delivery of general anesthesia and monitored anesthesia care (sedation or analgesia), outside or within the operating room by anesthesiologists or other practitioners functioning within a department of anesthesiology, are addressed by policies developed by the ASA and by individual departments of anesthesiology.[94] Also, guidelines for the sedation of patients undergoing mechanical ventilation in a critical care environment or for providing analgesia for patients postoperatively, patients with chronic painful conditions, and hospice care are beyond the scope of this document.

Definitions of terms for this report

- "Pediatric patients": all patients through 21 years of age, as defined by the AAP.
- "Must" or "shall": an imperative need or duty that is essential, indispensable, or mandatory.
- "Should": the recommended need and/or duty.
- "May" or "could": freedom or liberty to follow a suggested or reasonable alternative.
- "Medical supervision" or "medical personnel": a current, licensed practitioner in medicine, surgery, or dentistry trained in the administration of medications used for procedural sedation and the management of complications associated with these medications.
- "Are encouraged": a suggested or reasonable action to be taken.
- "ASA Physical Status Classification": guidelines for classifying the baseline health status according to the ASA (see Appendix B).
- "Minimal sedation" (old terminology "anxiolysis"): a drug-induced state during which patients respond normally to verbal commands. Although cognitive function and coordination may be impaired, ventilatory and cardiovascular functions are unaffected.
- "Moderate sedation" (old terminology "conscious sedation" or "sedation/analgesia"): a drug-induced depression of consciousness during which patients respond purposefully to verbal commands (eg,"open your eyes" either alone or accompanied by light tactile stimulation—a light tap on the shoulder or face, not a sternal rub). For older patients, this level of sedation implies an interactive state; for younger patients, age-appropriate behaviors (eg, crying) occur and are expected. Reflex withdrawal, although a normal response to a painful stimulus, is not considered as the only age-appropriate purposeful response (eg, it must be accompanied by another response, such as pushing away the painful stimulus so as to confirm a higher cognitive function). With moderate sedation, no intervention is required to maintain a patent airway, and spontaneous ventilation is adequate. Cardiovascular function is usually maintained. However, in the case of procedures that may themselves cause airway obstruction (eg, dental or endoscopic), the practitioner must recognize an obstruction and assist the patient in opening the airway. If the patient is not making spontaneous efforts to open his/her airway so as to relieve the obstruction, then the patient should be considered to be deeply sedated.
- "Deep sedation" ("deep sedation/analgesia"): a drug-induced depression of consciousness during which patients cannot be easily aroused but respond purposefully (see discussion of reflex withdrawal above) after repeated verbal or painful

stimulation (eg, purposefully pushing away the noxious stimuli). The ability to independently maintain ventilatory function may be impaired. Patients may require assistance in maintaining a patent airway, and spontaneous ventilation may be inadequate. Cardiovascular function is usually maintained. A state of deep sedation may be accompanied by partial or complete loss of protective airway reflexes.

- "General anesthesia": a drug-induced loss of consciousness during which patients are not arousable, even by painful stimulation. The ability to independently maintain ventilatory function is often impaired. Patients often require assistance in maintaining a patent airway, and positive-pressure ventilation may be required because of depressed spontaneous ventilation or drug-induced depression of neuromuscular function. Cardiovascular function may be impaired.

Goals of sedation

The goals of sedation in the pediatric patient for diagnostic and therapeutic procedures are: 1) to guard the patient's safety and welfare, 2) to minimize physical discomfort and pain, 3) to control anxiety, minimize psychological trauma, and maximize the potential for amnesia, 4) to control behavior and/or movement so as to allow the safe completion of the procedure, and 5) to return the patient to a state in which safe discharge from medical supervision, as determined by recognized criteria, is possible (Appendix A).

These goals can best be achieved by selecting the lowest dose of drug with the highest therapeutic index for the procedure. It is beyond the scope of this document to specify which drugs are appropriate for which procedures; however, the selection of the fewest number of drugs and matching drug selection to the type and goal of the procedure are essential for safe practice.[53,88,91-93,95-97] For example, analgesic medications such as opioids are indicated for painful procedures. For nonpainful procedures, such as computed tomography or magnetic resonance imaging (MRI), sedatives/hypnotics are preferred. When both sedation and analgesia are desirable (eg, fracture reduction), either single agents with analgesic/sedative properties or combination regimens commonly are used. Anxiolysis and amnesia are additional goals that should be considered in selection of agents for particular patients. However, the potential for an adverse outcome may be increased when three or more sedating medications are administered.[44,98] Knowledge of each drug's time of onset, peak response, and duration of action is essential. Although the concept of titration of drug to effect is critical, one must know whether the previous dose has taken full effect before administering additional drug. Such management will improve safety and outcomes. Drugs with long durations of action (eg, chloral hydrate, intramuscular pentobarbital, phenothiazines) will require longer periods of observation even after the child achieves currently used recovery and discharge criteria.[45,99,100] This concept is particularly important for infants and toddlers transported in car safety seats who are at risk of resedation after discharge because of residual prolonged drug effects with the potential for airway obstruction.[45,46]

General guidelines

Candidates

Patients who are in ASA classes I and II are frequently considered appropriate candidates for minimal, moderate, or deep sedation (Appendix B). Children in ASA classes III and IV, children with special needs, and those with anatomic airway abnormalities or extreme tonsillar hypertrophy present issues that require additional and individual consideration, particularly for moderate and deep sedation.[51] Practitioners are encouraged to consult with appropriate subspecialists and/or an anesthesiologist for patients at increased risk of experiencing adverse sedation events because of their underlying medical/surgical conditions.

Responsible person

The pediatric patient shall be accompanied to and from the treatment facility by a parent, legal guardian, or other responsible person. It is preferable to have two or more adults accompany children who are still in car safety seats if transportation to and from a treatment facility is provided by one of the adults.[101]

Facilities

The practitioner who uses sedation must have immediately available facilities, personnel, and equipment to manage emergency and rescue situations. The most common serious complications of sedation involve compromise of the airway or depressed respirations resulting in airway obstruction, hypoventilation, hypoxemia, and apnea. Hypotension and cardiopulmonary arrest may occur, usually from inadequate recognition and treatment of respiratory compromise. Other rare complications may also include seizures and allergic reactions. Facilities providing pediatric sedation should monitor for, and be prepared to treat, such complications.

Back-up emergency services

A protocol for access to back-up emergency services shall be clearly identified, with an outline of the procedures necessary for immediate use. For nonhospital facilities, a protocol for ready access to ambulance service and immediate activation of the EMS system for life-threatening complications must be established and maintained. It should be understood that the availability of EMS services does not replace the practitioner's responsibility to provide initial rescue in managing life-threatening complications.

On-site monitoring and rescue equipment

An emergency cart or kit must be immediately accessible. This cart or kit must contain equipment to provide the necessary age- and size-appropriate drugs and equipment to resuscitate a nonbreathing and unconscious child. The contents of the kit must allow for the provision of continuous life support while the patient is being transported to a medical facility or to another area within a medical facility. All equipment and drugs must be checked and maintained on a scheduled basis (see Appendices C and D for suggested drugs and emergency life support equipment to consider before the need for rescue occurs). Monitoring devices, such as electrocardiography (ECG)

machines, pulse oximeters (with size-appropriate oximeter probes), end-tidal carbon dioxide monitors, and defibrillators (with size-appropriate defibrillator paddles), must have a safety and function check on a regular basis as required by local or state regulation.

Documentation before sedation

Documentation shall include, but not be limited to, the guidelines that follow:

1. Informed consent. The patient record shall document that appropriate informed consent was obtained according to local, state, and institutional requirements.[102]
2. Instructions and information provided to the responsible person. The practitioner shall provide verbal and/or written instructions to the responsible person. Information shall include objectives of the sedation and anticipated changes in behavior during and after sedation. Special instructions shall be given to the adult responsible for infants and toddlers who will be transported home in a car safety seat regarding the need to carefully observe the child's head position so as to avoid airway obstruction. Transportation by car safety seat poses a particular risk for infants who have received medications known to have a long half-life, such as chloral hydrate, intramuscular pentobarbital, or phenothiazine.[45,46,100,103] Consideration for a longer period of observation shall be given if the responsible person's ability to observe the child is limited (eg, only one adult who also has to drive). Another indication for prolonged observation would be a child with an anatomic airway problem or a severe underlying medical condition. A 24-hour telephone number for the practitioner or his or her associates shall be provided to all patients and their families. Instructions shall include limitations of activities and appropriate dietary precautions.

Dietary precautions

Agents used for sedation have the potential to impair protective airway reflexes, particularly during deep sedation. Although a rare occurrence, pulmonary aspiration may occur if the child regurgitates and cannot protect his or her airway. Therefore, it is prudent that before sedation, the practitioner evaluate preceding food and fluid intake. It is likely that the risk of aspiration during procedural sedation differs from that during general anesthesia involving tracheal intubation or other airway manipulation.[104,105] However, because the absolute risk of aspiration during procedural sedation is not yet known, guidelines for fasting periods before elective sedation generally should follow those used for elective general anesthesia. For emergency procedures in children who have not fasted, the risks of sedation and the possibility of aspiration must be balanced against the benefits of performing the procedure promptly (see next column). Further research is needed to better elucidate the relationships between various fasting intervals and sedation complications.

Before Elective Sedation

Children receiving sedation for elective procedures should generally follow the same fasting guidelines as before general anesthesia (Table 1). It is permissible for routine necessary medications to be taken with a sip of water on the day of the procedure.

For the Emergency Patient

The practitioner must always balance the possible risks of sedating nonfasted patients with the benefits and necessity for completing the procedure. In this circumstance, the use of sedation must be preceded by an evaluation of food and fluid intake. There are few published studies with adequate statistical power to provide guidance to the practitioner regarding safety or risk of pulmonary aspiration of gastric contents during procedural sedation.[104-109] When protective airway reflexes are lost, gastric contents may be regurgitated into the airway. Therefore, patients with a history of recent oral intake or with other known risk factors, such as trauma, decreased level of consciousness, extreme obesity, pregnancy, or bowel motility dysfunction, require careful evaluation before administration of sedatives. When proper fasting has not been ensured, the increased risks of sedation must be carefully weighed against its benefits, and the lightest effective sedation should be used. The use of agents with less risk of depressing protective airway reflexes may be preferred.[110] Some emergency patients requiring deep sedation may require protection of the airway before sedation.

Use of immobilization devices

Immobilization devices, such as papoose boards, must be applied in such a way as to avoid airway obstruction or chest restriction. The child's head position and respiratory excursions should be checked frequently to ensure airway patency. If an immobilization device is used, a hand or foot should be kept exposed, and the child should never be left unattended. If sedating medications are administered in conjunction with an immobilization device, monitoring must be used at a level consistent with the level of sedation achieved.

Documentation at the time of sedation

1. Health evaluation. Before sedation, a health evaluation shall be performed by an appropriately-licensed practitioner and reviewed by the sedation team at the time of treatment for possible interval changes. The purpose of this evaluation is not only to document baseline status but also to determine whether patients present specific risk factors that may warrant additional consultation before sedation. This evaluation will also screen out patients whose sedation will require more advanced airway or cardiovascular management skills or alterations in the doses or types of medications used for procedural sedation.

   A new concern for the practitioner is the widespread use of medications that may interfere with drug absorption or metabolism and, therefore, enhance or shorten the effect time of sedating medications. Herbal medicines

(eg, St. John's wort, echinacea) may alter drug pharmacokinetics through inhibition of the cytochrome P450 system, resulting in prolonged drug effect and altered (increased or decreased) blood drug concentrations.[111-116] Kava may increase the effects of sedatives by potentiating gamma-aminobutyric acid inhibitory neurotransmission, and valerian may itself produce sedation that apparently is mediated through modulation of gamma-aminobutyric acid neurotransmission and receptor function.[117,118] Drugs such as erythromycin, cimetidine, and others also may inhibit the cytochrome P450 system, resulting in prolonged sedation with midazolam as well as other medications competing for the same enzyme systems.[119-122] Medications used to treat human immunodeficiency virus infection, some anticonvulsants, and some psychotropic medications also may produce clinically important drug-drug interactions.[123-125] Therefore, a careful drug history is a vital part of the safe sedation of children. The clinician should consult various sources (a pharmacist, textbooks, online services, or handheld databases) for specific information on drug interactions.[126]

The health evaluation should include:

- Age and weight.
- Health history, including: 1) allergies and previous allergic or adverse drug reactions, 2) medication/drug history, including dosage, time, route, and site of administration for prescription, over-the-counter, herbal, or illicit drugs, 3) relevant diseases, physical abnormalities, and neurologic impairment that might increase the potential for airway obstruction, such as a history of snoring or obstructive sleep apnea,[127,128] 4) pregnancy status, 5) a summary of previous relevant hospitalizations, 6) history of sedation or general anesthesia and any complications or unexpected responses, and 7) relevant family history, particularly related to anesthesia.
- Review of systems with a special focus on abnormalities of cardiac, pulmonary, renal, or hepatic function that might alter the child's expected responses to sedating/analgesic medications.
- Vital signs, including heart rate, blood pressure, respiratory rate, and temperature (for some children who are very upset or noncooperative, this may not be possible and a note should be written to document this occurrence).
- Physical examination, including a focused evaluation of the airway (tonsillar hypertrophy, abnormal anatomy—eg, mandibular hypoplasia) to determine whether there is an increased risk of airway obstruction[54,129,130].
- Physical status evaluation [ASA classification (see Appendix B)].
- Name, address, and telephone number of the child's medical home.

For hospitalized patients, the current hospital record may suffice for adequate documentation of presedation health; however, a brief note shall be written documenting that the chart was reviewed, positive findings were noted, and a management plan was formulated. If the clinical or emergency condition of the patient precludes acquiring complete information before sedation, this health evaluation should be obtained as soon as feasible.

2. Prescriptions. When prescriptions are used for sedation, a copy of the prescription or a note describing the content of the prescription should be in the patient's chart along with a description of the instructions that were given to the responsible person. **Prescription medications intended to accomplish procedural sedation must not be administered without the benefit of direct supervision by trained medical personnel.** Administration of sedating medications at home poses an unacceptable risk, particularly for infants and preschool-aged children traveling in car safety seats.[46]

Documentation during treatment

The patient's chart shall contain a time-based record that includes the name, route, site, time, dosage, and patient effect of administered drugs. Before sedation, a "time out" should be performed to confirm the patient's name, procedure to be performed, and site of the procedure.[43] During administration, the inspired concentrations of oxygen and inhalation sedation agents and the duration of their administration shall be documented. Before drug administrations, special attention must be paid to calculation of dosage (ie, mg/kg). The patient's chart shall contain documentation at the time of treatment that the patient's level of consciousness and responsiveness, heart rate, blood pressure, respiratory rate, and oxygen saturation were monitored until the patient attained predetermined discharge criteria (see Appendix A). A variety of sedation scoring systems are available and may aid this process.[70,100] Adverse events and their treatment shall be documented.

Documentation after treatment

The time and condition of the child at discharge from the treatment area or facility shall be documented; this should include documentation that the child's level of consciousness and oxygen saturation in room air have returned to a state that is safe for discharge by recognized criteria (see Appendix A). Patients receiving supplemental oxygen before the procedure should have a similar oxygen need after the procedure. Because some sedation medications are known to have a long half-life and may delay a patient's complete return to baseline or pose the risk of resedation,[45,103,131,132] some patients might benefit from a longer period of less-intense observation (eg, a step-down observation area) before discharge from medical supervision.[133] Several scales to evaluate recovery have been devised and validated.[70,134,135] A recently described and simple evaluation tool may be the ability of the infant or child to remain awake for at least 20 minutes when placed in a quiet environment.[100]

Continuous quality improvement

The essence of medical error reduction is a careful examination of index events and root cause analysis of how the event could be avoided in the future.[137-141] Therefore, each facility should maintain records that track adverse events, such as desaturation, apnea, laryngospasm, the need for airway interventions including jaw thrust, positive pressure ventilation, prolonged sedation, unanticipated use of reversal agents, unintended or prolonged hospital admission, and unsatisfactory sedation/analgesia/anxiolysis. Such events can then be examined for assessment of risk reduction and improvement in patient satisfaction.

Preparation and setting up for sedation procedures

Part of the safety net of sedation is to use a systematic approach so as to not overlook having an important drug, piece of equipment, or monitor immediately available at the time of a developing emergency. To avoid this problem, it is helpful to use an acronym that allows the same setup and checklist for every procedure. A commonly used acronym useful in planning and preparation for a procedure is SOAPME:

- **S** = Size-appropriate **suction** catheters and a functioning **suction** apparatus (eg, Yankauer-type suction)
- **O** = An adequate **oxygen** supply and functioning flow meters/other devices to allow its delivery
- **A** = **Airway:** size-appropriate airway equipment [nasopharyngeal and oropharyngeal airways, laryngoscope blades (checked and functioning), endotracheal tubes, stylets, face mask, bag-valve-mask or equivalent device (functioning)]
- **P** = **Pharmacy:** all the basic drugs needed to support life during an emergency, including antagonists as indicated
- **M** = **Monitors:** functioning pulse oximeter with size-appropriate oximeter probes[141,142] and other monitors as appropriate for the procedure (eg, noninvasive blood pressure, end-tidal carbon dioxide, ECG, stethoscope)
- **E** = Special **equipment or drugs** for a particular case (eg, defibrillator)

Specific guidelines for intended level of sedation

Minimal sedation

Minimal sedation (old terminology "anxiolysis") is a drug-induced state during which patients respond normally to verbal commands. Although cognitive function and coordination may be impaired, ventilatory and cardiovascular functions are unaffected. Children who have received minimal sedation generally will not require more than observation and intermittent assessment of their level of sedation. Some children will become moderately sedated despite the intended level of minimal sedation; should this occur, then the guidelines for moderate sedation apply.[57]

Moderate sedation

"Moderate sedation" (old terminology "conscious sedation" or "sedation/analgesia") is a drug-induced depression of consciousness during which patients respond purposefully to verbal commands or following light tactile stimulation (see Definition of Terms for This Report). No interventions are required to maintain a patent airway, and spontaneous ventilation is adequate. Cardiovascular function usually is maintained. The caveat that loss of consciousness should be unlikely is a particularly important aspect of the definition of moderate sedation. The drugs and techniques used should carry a margin of safety wide enough to render unintended loss of consciousness highly unlikely. Because the patient who receives moderate sedation may progress into a state of deep sedation and obtundation, the practitioner should be prepared to increase the level of vigilance corresponding to what is necessary for deep sedation.[57]

Personnel

The practitioner. The practitioner responsible for the treatment of the patient and/or the administration of drugs for sedation must be competent to use such techniques, to provide the level of monitoring provided in this guideline, and to manage complications of these techniques (ie, to be able to rescue the patient). Because the level of intended sedation may be exceeded, the practitioner must be sufficiently skilled to provide rescue should the child progress to a level of deep sedation. The practitioner must be trained in, and capable of providing, at the minimum, bag-valve-mask ventilation so as to be able to oxygenate a child who develops airway obstruction or apnea. Training in, and maintenance of, advanced pediatric airway skills is required; regular skills reinforcement is strongly encouraged.

Support personnel. The use of moderate sedation shall include provision of a person, in addition to the practitioner, whose responsibility is to monitor appropriate physiologic parameters and to assist in any supportive or resuscitation measures, if required. This individual may also be responsible for assisting with interruptible patient-related tasks of short duration.[44] This individual must be trained in and capable of providing pediatric basic life support. The support person shall have specific assignments in the event of an emergency and current knowledge of the emergency cart inventory. The practitioner and all ancillary personnel should participate in periodic reviews and practice drills of the facility's emergency protocol to ensure proper function of the equipment and coordination of staff roles in such emergencies.

Monitoring and Documentation

Baseline. Before administration of sedative medications, a baseline determination of vital signs shall be documented. For some children who are very upset or noncooperative, this may not be possible and a note should be written to document this happenstance.

During the procedure. The practitioner shall document the name, route, site, time of administration, and dosage of all drugs administered. There shall be continuous monitoring of oxygen saturation and heart rate and intermittent recording of respiratory rate and blood pressure; these should be recorded in a time-based record. Restraining devices should be checked to prevent airway obstruction or chest restriction. If a restraint device is used, a hand or foot should be kept exposed. The child's head position should be checked frequently to ensure airway patency. A functioning suction apparatus must be present.

After the procedure. The child who has received moderate sedation must be observed in a suitably equipped recovery facility [eg, the facility must have functioning suction apparatus as well as the capacity to deliver more than 90 percent oxygen and positive-pressure ventilation (eg, bag and mask with oxygen capacity as described previously)]. The patient's vital signs should be recorded at specific intervals. If the patient is not fully alert, oxygen saturation and heart rate monitoring shall be used continuously until appropriate discharge criteria are met (see Appendix A). Because sedation medications with a long half-life may delay the patient's complete return to baseline or pose the risk of resedation, some patients might benefit from a longer period of less-intense observation (eg, a step-down observation area where multiple patients can be observed simultaneously) before discharge from medical supervision (see also Documentation Before Sedation for instructions to families).[45,103,131,132] A recently described and simple evaluation tool may be the ability of the infant or child to remain awake for at least 20 minutes when placed in a quiet environment.[100] Patients who have received reversal agents, such as flumazenil or naloxone, will also require a longer period of observation, because the duration of the drugs administered may exceed the duration of the antagonist, which can lead to resedation.

Deep sedation

Deep sedation is a drug-induced depression of consciousness during which patients cannot be easily aroused but respond purposefully after repeated verbal or painful stimulation (see Definition of Terms for this report). The state and risks of deep sedation may be indistinguishable from those of general anesthesia.

Personnel

There must be one person available whose only responsibility is to constantly observe the patient's vital signs, airway patency, and adequacy of ventilation and to either administer drugs or direct their administration. At least one individual must be present who is trained in, and capable of, providing advanced pediatric life support, and who is skilled in airway management and cardiopulmonary resuscitation; training in pediatric advanced life support is required.

Equipment

In addition to the equipment previously cited for moderate sedation, an electrocardiographic monitor and a defibrillator for use in pediatric patients should be readily available.

Vascular Access

Patients receiving deep sedation should have an intravenous line placed at the start of the procedure or have a person skilled in establishing vascular access in pediatric patients immediately available.

Monitoring and Documentation

A competent individual shall observe the patient continuously. The monitoring shall include all parameters described for moderate sedation. Vital signs, including oxygen saturation and heart rate, must be documented at least every five minutes in a time-based record. The use of a precordial stethoscope or capnograph for patients difficult to observe (eg, during MRI, in a darkened room) to aid in monitoring adequacy of ventilation is encouraged.[143] The practitioner shall document the name, route, site, time of administration, and dosage of all drugs administered. The inspired concentrations of inhalation sedation agents and oxygen and the duration of administration shall be documented.

Postsedation Care

The facility and procedures followed for postsedation care shall conform to those described under "Moderate Sedation."

Special considerations

Local anesthetic agents

All local anesthetic agents are cardiac depressants and may cause central nervous system excitation or depression. Particular attention should be paid to dosage in small children.[64,66] To ensure that the patient will not receive an excessive dose, the maximum allowable safe dosage (ie, mg/kg) should be calculated before administration. There may be enhanced sedative effects when the highest recommended doses of local anesthetic drugs are used in combination with other sedatives or narcotics (see Tables two and three for limits and conversion tables of commonly used local anesthetics).[64,144-157] In general, when administering local anesthetic drugs, the practitioner should aspirate frequently so as to minimize the likelihood that the needle is in a blood vessel; lower doses should be used when injecting into vascular tissues.[158]

Pulse oximetry

The new generation of pulse oximeters is less susceptible to motion artifacts and may be more useful than older oximeters that do not contain the updated software.[159-163] Oximeters that change tone with changes in hemoglobin saturation provide immediate aural warning to everyone within hearing distance. It is essential that any oximeter probe is positioned properly; clip-on devices are prone to easy displacement, which may produce artifactual data (eg, under- or overestimation of oxygen saturation).[141,142]

Capnography

Expired carbon dioxide monitoring is valuable to diagnose the simple presence or absence of respirations, airway obstruction, or respiratory depression, particularly in patients sedated in less-accessible locations, such as magnetic resonance imaging or computerized axial tomography devices or darkened rooms.[47,49,50,143,164-173] The use of expired carbon dioxide monitoring devices is encouraged for sedated children, particularly in situations where other means of assessing the adequacy of ventilation are limited. Several manufacturers have produced nasal cannulae that allow simultaneous delivery of oxygen and measurement of expired carbon dioxide values.[164,165] Although these devices can have a high degree of false-positive alarms, they are also very accurate for the detection of complete airway obstruction or apnea.[166,168,173]

Adjuncts to airway management and resuscitation

The vast majority of sedation complications can be managed with simple maneuvers, such as supplemental oxygen, opening the airway, suctioning, and bag-mask-valve ventilation. Occasionally, endotracheal intubation is required for more prolonged ventilatory support. In addition to standard endotracheal intubation techniques, a number of new devices are available for the management of patients with abnormal airway anatomy or airway obstruction. Examples include the laryngeal mask airway (LMA), the cuffed oropharyngeal airway, and a variety of kits to perform an emergency cricothyrotomy.

The largest clinical experience in pediatrics is with the LMA, which is available in a variety of sizes and can even be used in neonates. Use of the LMA is now being introduced into advanced airway training courses, and familiarity with insertion techniques can be life saving.[174,175] The LMA also can serve as a bridge to secure airway management in children with anatomic airway abnormalities.[176,177] Practitioners are encouraged to gain experience with these techniques as they become incorporated into pediatric advanced life support courses.

An additional emergency device with which to become familiar is the intraosseous needle. Intraosseous needles also are available in several sizes and can be life saving in the rare situation when rapid establishment of intravenous access is not possible. Familiarity with the use of these adjuncts for the management of emergencies can be obtained by keeping current with resuscitation courses, such as Pediatric Advanced Life Support and Advanced Pediatric Life Support or other approved programs.

Patient simulators

Advances in technology, particularly patient simulators that allow a variety of programmed adverse events (eg, apnea, bronchospasm, laryngospasm), response to medical interventions, and printouts of physiologic parameters, are now available. The use of such devices is encouraged to better train medical professionals to respond more appropriately and effectively to rare events.[178-180]

Monitoring during MRI

The powerful magnetic field and the generation of radiofrequency emissions necessitate the use of special equipment to provide continuous patient monitoring throughout the MRI scanning procedure. Pulse oximeters capable of continuous function during scanning should be used in any sedated or restrained pediatric patient. Thermal injuries can result if appropriate precautions are not taken; avoid coiling the oximeter wire and place the probe as far from the magnetic coil as possible to diminish the possibility of injury. Electrocardiogram monitoring during magnetic resonance imaging has been associated with thermal injury; special MRI-compatible ECG pads are essential to allow safe monitoring.[181-184] Expired carbon dioxide monitoring is strongly encouraged in this setting.

Nitrous oxide

Inhalation sedation/analgesia equipment that delivers nitrous oxide must have the capacity of delivering 100 percent and never less than 25 percent oxygen concentration at a flow rate appropriate to the size of the patient. Equipment that delivers variable ratios of nitrous oxide to oxygen and that has a delivery system that covers the mouth and nose must be used in conjunction with a calibrated and functional oxygen analyzer. All nitrous oxide-to-oxygen inhalation devices should be calibrated in accordance with appropriate state and local requirements. Consideration should be given to the National Institute of Occupational Safety and Health standards for the scavenging of waste gases.[185] Newly constructed or reconstructed treatment facilities, especially those with piped-in nitrous oxide and oxygen, must have appropriate state or local inspections to certify proper function of inhalation sedation/analgesia systems before any delivery of patient care.

Nitrous oxide in oxygen with varying concentrations has been successfully used for many years to provide analgesia for a variety of painful procedures in children.[15,186-210] The use of nitrous oxide for minimal sedation is defined as the administration of nitrous oxide (50 percent or less) with the balance as oxygen, without any other sedative, narcotic, or other depressant drug before or concurrent with the nitrous oxide to an otherwise healthy patient in ASA class I or II. The patient is able to maintain verbal communication throughout the procedure. It should be noted that although local anesthetics have sedative properties, for purposes of this guideline, they are not considered sedatives in this circumstance. If nitrous oxide in oxygen is combined with other sedating medications, such as chloral hydrate, midazolam, or an opioid, or if nitrous oxide is used in concentrations greater than 50 percent, the likelihood for moderate or deep sedation increases.[211,212] In this situation, the clinician must be prepared to institute the guidelines for moderate or deep sedation as indicated by the patient's response.[213]

Table 1. APPROPRIATE INTAKE OF FOOD AND LIQUIDS BEFORE ELECTIVE SEDATION*

Ingested material	Minimum fasting period (h)
Clear liquids: water, fruit juices without pulp, carbonated beverages, clear tea, black coffee	2
Breast milk	4
Infant formula	6
Nonhuman milk: because nonhuman milk is similar to solids in gastric emptying time, the amount ingested must be considered when determining an appropriate fasting period	6
Light meal: a light meal typically consists of toast and clear liquids. Meals that include fried or fatty foods or meat may prolong gastric emptying time. Both the amount and type of foods ingested must be considered when determining an appropriate fasting period.	6

* American Society of Anesthesiologists. Practice Guidelines for Preoperative Fasting and the Use of Pharmacologic Agents to Reduce the Risk of Pulmonary Aspiration: Application to Healthy Patients Undergoing Elective Procedures. A Report of the American Society of Anesthesiologists. Available at: "http://www.asahq.org/publicationsAndServices/npoguide.html".

Table 2. COMMONLY USED LOCAL ANESTHETIC AGENTS: DOSES, DURATION, AND CALCULATIONS*

Local anesthetic	Maximum dose with Epinephrine (mg/		Duration of action (min) ‡
	Medical	Dental	
Esters			
Procaine	10.0	6	60-90
Chloroprocaine	20.0	12	30-60
Tetracaine	1.5	1	180-600
Amides			
Lidocaine	7.0	4.4	90-200
Mepivacaine	7.0	4.4	120-240
Bupivacaine	3.0	13	180-600
Levobupivacaine	3.0	2	180-600
Ropivacaine	3.0	2	180-600
Articaine		7	60-230

* Maximum recommended doses and duration of action. Note that lower doses should be used in very vascular areas.

† These are maximum doses of local anesthetics combined with epinephrine; lower doses are recommended when used without epinephrine. Doses of amides should be decreased by 30 percent in infants younger than six months. When lidocaine is being administered intravascularly (eg, during intravenous regional anesthesia), the dose should be decreased to three to five mg/kg; long-acting local anesthetic agents should not be used for intravenous regional anesthesia.

‡ Duration of action is dependent on concentration, total dose, and site of administration; use of epinephrine; and the patient's age.

Table 3. LOCAL ANESTHETIC PERCENT CONCENTRATION: CONVERSION TO mg/mL

Concentration (%)	mg/mL
3.0	30.0
2.5	25.0
2.0	20.0
1.0	10.0
0.5	5.0
025	2.5
0.125	1.25

Appendix A. Recommended Discharge Criteria

1. Cardiovascular function and airway patency are satisfactory and stable.
2. The patient is easily arousable, and protective reflexes are intact.
3. The patient can talk (if age appropriate).
4. The patient can sit up unaided (if age appropriate).
5. For a very young or handicapped child incapable of the usually expected responses, the presedation level of responsiveness or a level as close as possible to the normal level for that child should be achieved.
6. The state of hydration is adequate.

Appendix B. ASA Physical Status Classification

Class I	A normally healthy patient.
Class II	A patient with mild systemic disease (eg, controlled reactive airway disease).
Class III	A patient with severe systemic disease (eg, a child who is actively wheezing).
Class IV	A patient with severe systemic disease that is a constant threat to life (eg, a child with status asthmaticus).
Class V	A moribund patient who is not expected to survive without the operation (eg, a patient with severe cardiomyopathy requiring heart transplantation).

Appendix C. Drugs* That May Be Needed to Rescue a Sedated Patient[44]

Albuterol for inhalation
Ammonia spirits
Atropine
Diphenhydramine
Diazepam
Epinephrine (1:1000, 1:10 000)
Flumazenil
Glucose (25 percent or 50 percent)
Lidocaine (cardiac lidocaine, local infiltration)
Lorazepam
Methylprednisolone
Naloxone
Oxygen
Fosphenytoin
Racemic epinephrine
Rocuronium
Sodium bicarbonate
Succinylcholine

* The choice of emergency drugs may vary according to individual or procedural needs.

Appendix D. Emergency Equipment† That May Be Needed to Rescue a Sedated Patient‡

Intravenous Equipment

- Assorted IV catheters (eg, 24-, 22-, 20-, 18-, 16-gauge)
- Tourniquets
- Alcohol wipes
- Adhesive tape
- Assorted syringes (eg, 1-, 3-, 5-, 10-mL)
- IV tubing
  - Pediatric drip (60 drops/mL)
  - Pediatric burette
  - Adult drip (10 drops/mL)
  - Extension tubing
  - 3-way stopcocks
- IV fluid
  - Lactated Ringer solution
  - Normal saline solution
  - D_5 0.25 normal saline solution
- Pediatric IV boards
- Assorted IV needles (eg, 25-, 22-, 20-, and 18-gauge)
- Intraosseous bone marrow needle
- Sterile gauze pads

Airway Management Equipment

- Face masks (infant, child, small adult, medium adult, large adult)
- Breathing bag and valve set
- Oropharyngeal airways (infant, child, small adult, medium adult, large adult)
- Nasopharyngeal airways (small, medium, large)
- Laryngeal mask airways (1, 1.5, 2, 2.5, 3, 4, and 5)
- Laryngoscope handles (with extra batteries)
- Laryngoscope blades (with extra light bulbs)
  - Straight (Miller) No. 1, 2, and 3
  - Curved (Macintosh) No. 2 and 3
- Endotracheal tubes (2.5, 3.0, 3.5, 4.0, 4.5, 5.0, 5.5, and 6.0 uncuffed and 6.0, 7.0, and 8.0 cuffed)
- Stylettes (appropriate sizes for endotracheal tubes)
- Surgical lubricant
- Suction catheters (appropriate sizes for endotracheal tubes)
- Yankauer-type suction
- Nasogastric tubes
- Nebulizer with medication kits
- Gloves (sterile and nonsterile, latex free)

† The choice of emergency equipment may vary according to individual or procedural needs.

‡ The practitioner is referred to the SOAPME acronym described in the text in preparation for sedating a child for a procedure.

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Guideline on Use of Anesthesia Personnel in the Administration of Office-based Deep Sedation/ General Anesthesia to the Pediatric Dental Patient

Originating Committee
Clinical Affairs Committee – Sedation and General Anesthesia Subcommittee

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Purpose

The American Academy of Pediatric Dentistry (AAPD) recognizes that there are pediatric dental patients for whom routine dental care using nonpharmacologic behavior guidance techniques is not a viable approach.[1] The AAPD intends this guideline to assist the dental practitioner who elects to use anesthesia personnel for the administration of deep sedation/ general anesthesia for pediatric dental patients in a dental office or other facility outside of an accredited hospital or surgicenter. This document discusses personnel, facilities, documentation, and quality assurance mechanisms necessary to provide optimal and responsible patient care.

Methods

The revision of this guideline is based upon a review of current dental and medical literature pertaining to deep sedation/ general anesthesia of dental patients, including a systematic literature search of the MEDLINE/PubMed® electronic data-base with the following parameters: Terms: "office-based general anesthesia", "pediatric sedation", "deep sedation", "sleep dentistry", and "dental sedation"; Fields: all; Limits: within the last 10 years, humans, all children from birth through age 18, English, clinical trials, and literature reviews. The search returned 62 articles; the reviewers agreed upon the inclusion of 10 articles that met the defined criteria. When data did not appear sufficient or were inconclusive, recommendations were based upon expert and/or consensus opinion by experienced researchers and clinicians.

Background

Pediatric dentists seek to provide oral health care to infants, children, adolescents, and persons with special health care needs in a manner that promotes excellence in quality of care and concurrently induces a positive attitude in the patient toward dental treatment. Behavior guidance techniques have allowed most pediatric dental patients to receive treatment in the dental office with minimal discomfort and without expressed fear. Minimal or moderate sedation has allowed others who are less compliant to receive treatment. There are some children and special needs patients with extensive treatment needs, acute situational anxiety, uncooperative age-appropriate behavior, immature cognitive functioning, disabilities, or medical conditions who require deep sedation/general anesthesia to receive dental treatment in a safe and humane fashion. Access to hospital-based anesthesia services may be limited for a variety of reasons, including restriction of coverage of by third party payors.[2] Pediatric dentists and others who treat children can provide for the administration of deep sedation/general anesthesia by utilizing properly trained individuals in their offices or other facilities outside of the traditional surgical setting.

Deep sedation/general anesthesia in the dental office can provide benefits for the patient and the dental team. Access to care may be improved. The treatment may be scheduled more easily and efficiently. Facility charges and administrative procedures may be less than those associated with a surgical center. Complex or lengthy treatment can be provided comfortably while minimizing patient memory of the dental procedure. Movement by the patient is decreased, and the quality of care may be improved. The dentist can use his/her customary in-office delivery system with access to trained auxiliary personnel, supplemental equipment, instrumentation, or supplies should the need arise.

The use of anesthesia personnel to administer deep sedation/general anesthesia in the pediatric dental population is an accepted treatment modality.[3-7] The AAPD supports the provision of deep sedation/general anesthesia when clinical indications have been met and additional properly-trained and credentialed personnel and appropriate facilities are used.[1,3,7] In many cases, the patient may be treated in an

appropriate out-patient facility (including the dental office) because the extensive medical resources of a hospital are not necessary.

Recommendations

Clinicians may consider using deep sedation or general anesthesia in the office to facilitate the provision of oral health care. Practitioners choosing to use these modalities must be familiar with their patient's medical history and emergency procedures, as well as the regulatory and professional liability insurance requirements needed to provide this level of pharmacologic behavior management. This guideline does not supersede, nor is it to be used in deference to, federal, state, and local creden-tialing and licensure laws, regulations, and codes.

Personnel

Office-based deep sedation/general anesthesia techniques require at least three individuals. The anesthesia care provider's responsibilities are to administer drugs or direct their administration and to observe constantly the patient's vital signs, airway patency, cardiovascular and neurological status, and adequacy of ventilation.[3] In addition to the anesthesia care provider, the operating dentist and other staff shall be trained in emergency procedures.

It is the obligation of treating practitioners, when employing anesthesia personnel to administer deep sedation/general anesthesia, to verify their credentials and experience.

- The anesthesia care provider must be a licensed dental and/or medical practitioner with appropriate and current state certification for deep sedation/general anesthesia.
- The anesthesia care provider must have completed a one- or two-year dental anesthesia residency or its equivalent, as approved by the American Dental Association (ADA), and/or medical anesthesia residency, as approved by the American Medical Association (AMA).
- The anesthesia care provider currently must be licensed by and in compliance with the laws of the state in which he/she practices. Laws vary from state to state and may supercede any portion of this document.
- If state law permits a certified registered nurse anesthetist or anesthesia assistant to function under the supervision of a dentist, the dentist is required to have completed training in deep sedation/general anesthesia and be licensed or permitted, as appropriate to state law.

The dentist and anesthesia care provider must be compliant with the American Academy of Pediatrics/AAPD's Guideline on Monitoring and Management of Pediatric Patients During and After Sedation for Diagnostic and Therapeutic Procedures[3] or other appropriate guideline(s) of the ADA, AMA, and their recognized specialties. The recommendations in this document may be exceeded at any time if the change involves improved safety and is supported by currently-accepted practice and/or is evidence-based.

The dentist and anesthesia personnel must work together to enhance patient safety. Effective communication is essential. The dentist introduces the concept of deep sedation/general anesthesia to the parent and provides appropriate preoperative instructions and informational materials. The dentist or his/her designee coordinates medical consultations when necessary. The anesthesia care provider explains potential risks and obtains informed consent for sedation/anesthesia. Office staff should understand their additional responsibilities and special considerations (eg, loss of protective reflexes) associated with office-based deep sedation/general anesthesia.

Advanced training in recognition and management of pediatric emergencies is critical in providing safe sedation and anesthetic care. There must be one person available whose only responsibilities are to constantly observe the patient's vital signs, airway patency, and adequacy of ventilation and to either administer drugs or direct their administration. At least one individual who is trained in and capable of providing advanced pediatric life support and who is skilled in airway management and cardiopulmonary resuscitation must be present; training in pediatric advanced life support is required.[3] An individual experienced in recovery care must be in attendance in the recovery facility until the patient, through continual monitoring, exhibits respiratory and cardiovascular stability and appropriate discharge criteria[3] have been met. In addition, the staff of the treating dentist must be well-versed in rescue and emergency protocols (including cardiopulmonary resuscitation) and have contact numbers for emergency medical services and ambulance services. Emergency preparedness must be updated and practiced on a regular basis.

Facilities

A continuum exists that extends from wakefulness across all levels of sedation. Often these levels are not easily differentiated, and patients may drift through them. When anesthesia care providers are utilized for office-based administration of deep sedation or general anesthesia, the facilities in which the dentist practices must meet the guidelines and appropriate local, state, and federal codes for administration of the deepest possible level of sedation/anesthesia. Facilities also should comply with applicable laws, codes, and regulations pertaining to controlled drug storage, fire prevention, building construction and occupancy, accommodations for the disabled, occupational safety and health, and disposal of medical waste and hazardous waste.[4] The treatment room must accommodate the dentist and auxiliaries, the patient, the anesthesia care provider, the dental equipment, and all necessary anesthesia delivery equipment along with appropriate monitors and emergency equipment. Expeditious access to the patient, anesthesia machine (if present), and monitoring equipment should be available at all times.

It is beyond the scope of this document to dictate equipment necessary for the provision of deep sedation/general anesthesia, but equipment must be appropriate for the technique used and consistent with the guidelines for anesthesia providers, in accordance with governmental rules and regulations. Because laws and codes vary from state to state, the

Guideline on Monitoring and Management of Pediatric Patients During and After Sedation for Diagnostic and Therapeutic Procedures[3] should be followed as the minimum requirements. For deep sedation, there shall be continuous monitoring of oxygen saturation and heart rate and intermittent time-based recording of respiratory rate and blood pressure. When adequacy of ventilation is difficult to observe, use of a precordial stethoscope or capnograph is encouraged.[3] An electrocardiographic monitor should be readily available for patients undergoing deep sedation. In addition to the monitors previously mentioned, a temperature monitor and pediatric defibrillator are required for general anesthesia.[3] Emergency equipment must be readily accessible and should include suction, drugs necessary for rescue and resuscitation (including 100 percent oxygen capable of being delivered by positive pressure at appropriate flow rates for up to one hour), and age-/size-appropriate equipment to resuscitate and rescue a non-breathing and/or unconscious pediatric dental patient and provide continuous support while the patient is being transported to a medical facility.[3,8] The treatment facility should have medications, equipment, and protocols available to treat malignant hyperthermia when triggering agents are used.[4] Recovery facilities must be available and suitably equipped. Back up power sufficient to ensure patient safety should be available in case of an emergency.[4]

Documentation

Prior to delivery of deep sedation/general anesthesia, patient safety requires that appropriate documentation shall address rationale for sedation/general anesthesia, informed consent, instructions to parent, dietary precautions, preoperative health evaluation, and any prescriptions along with the instructions given for their use.[3] Because laws and codes vary from state to state, the Guideline on Monitoring and Management of Pediatric Patients During and After Sedation for Diagnostic and Therapeutic Procedures[3] should be followed as minimum requirements for a time-based anesthesia record.

- Vital signs: Pulse and respiratory rates, blood pressure, and oxygen saturation must be monitored and recorded at least every 5 minutes[3] throughout the procedure and at specific intervals until the patient has met documented discharge criteria.
- Drugs: Name, dose, route, site, time of administration, and patient effect of all drugs, including local anesthesia, must be documented. When anesthetic gases are administered, inspired concentration and duration of inhalation agents and oxygen shall be documented.
- Recovery: The condition of the patient, that discharge criteria have been met, time of discharge, and into whose care the discharge occurred must be documented. Requiring the signature of the responsible adult to whom the child has been discharged, verifying that he/she has received and understands the post-operative instructions, is encouraged.

Various business/legal arrangements may exist between the treating dentist and the anesthesia provider. Regardless, because services were provided in the dental facility, the dental staff must maintain all patient records, including time-based anesthesia records, so that they may be readily available for emergency or other needs. The dentist must assure that the anesthesia provider also maintains patient records and that they are readily available.

Risk management and quality assurance

Dentists who utilize in-office anesthesia care providers must take all necessary measures to minimize risk to patients. The dentist must be familiar with the American Society of Anesthesiologists (ASA) physical status classification. Knowledge, preparation, and communication between professionals are essential.[9] Prior to subjecting a patient to deep sedation/general anesthesia, the patient must undergo a preoperative health evaluation.[3,10] High-risk patients should be treated in a facility properly equipped to provide for their care.[3,10] The dentist and anesthesia care provider must communicate during treatment to share concerns about the airway or other details of patient safety. Furthermore, they must work together to develop and document mechanisms of quality assurance.

Untoward and unexpected outcomes must be reviewed to monitor the quality of services provided. This will decrease risk, allow for open and frank discussions, document risk analysis and intervention, and improve the quality of care for the pediatric dental patient.

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