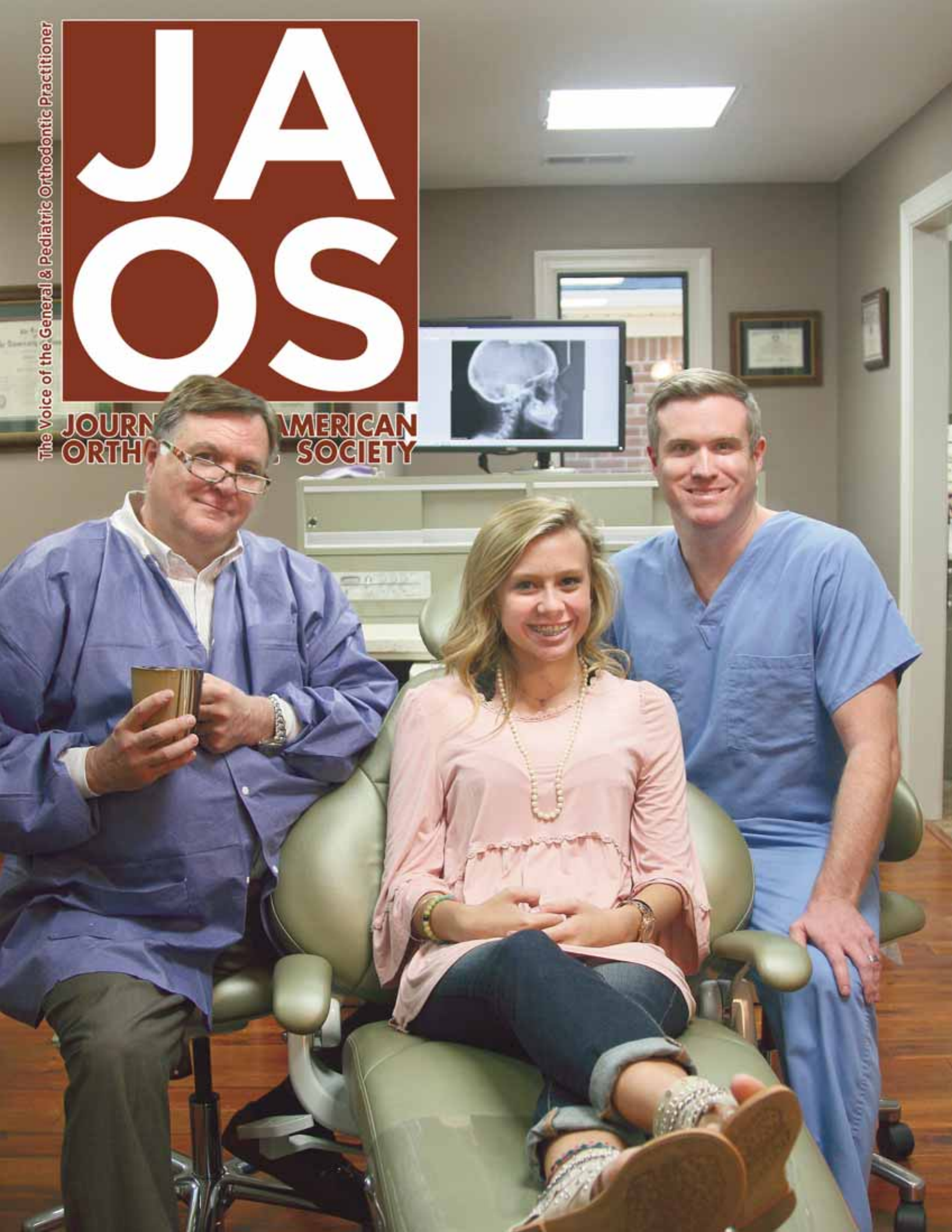


The Voice of the General & Pediatric Orthodontic Practitioner

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ERGONOMICS

for the ORTHODONTIC PRACTICE

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Fig. 1

Dentistry is an exciting, progressive, and fulfilling career. We are health care providers and want the best for our patients; every day, we provide preventative, restorative, and cosmetic recommendations and treatment to help our patients achieve that beautiful smile and optimal oral and systemic health. As clinicians, our heart is chairside, our patients are our priority, and we give 110% of ourselves, physically and mentally. The paradox is that despite the amazing everyday work we do as dental professionals in order for our patients to experience wellness, it can be at the expense of ourselves.

Musculoskeletal issues causing back, shoulder, and neck pain are common in all fields and procedures of dentistry, affecting 8 out of 10 dental practitioners. And orthodontic procedures are no

exception. Working with the challenges of dental and orthodontic procedures, day in and day out, results in clinicians spending hours leaning their heads forward, tipped to the side, working with rounded shoulders and their backs unsupported. This poor posture places stress on the entire body causing unnecessary strain, repetitive stress and injury to the skeletal system, the nerves, and blood vessels of the body. Many aches and pains result directly from how we work; however, these symptoms are often ignored, tolerated and/or temporarily relieved with pain relievers with the hope the symptoms will go away.

There are things we cannot change in dentistry, making ergonomics a challenge, but the opposite is also true; there are things we can change and control, which can allow us to continue to

care for our patients with better access, visibility, and comfort.

Here are a few suggestions on ways to stay pain-free and experience longevity as a dental practitioner.

CLINICIAN AND PATIENT POSITIONING

One of the fundamentals taught in school is the proper positioning of both the clinician and the patient. Although clinician and patient positioning is a simple concept, it is not always easily implemented with the challenges of limited visibility and hard to reach areas. As a result, proper clinician and patient positioning often can be compromised in order to get the job done.

An ergonomic advantage of orthodontic procedures is that it often involves a younger patient-base, who are usually more compliant and can be trained to sit properly reclined, thus allow-

ing for proper patient positioning. In an older patient-centric practice, this luxury is not always available, and a common complaint of older patients is not to be fully reclined, making visibility an issue for the clinician.

Although the clinician is at an advantage in being able to recline children, teenagers, and young adults during orthodontic procedures, the challenge of smaller heads not vertically high enough may be an ergonomic challenge. A simple solution is having a pillow or foam wedge accessible to prop patients who are too small for the dental chair and/or moving the patient chair vertically higher to allow better access. (Fig. 2)

For an adult who cannot be reclined and instances when a patient will not allow you to position them in proper semi-supine positioning, the alternative would be keeping the patient upright and working standing up. Working like the first dental operators did in the historic "barber's chair" position will prevent you the clinician from bending and twisting excessively when a patient cannot be reclined.

DIRECT VS. INDIRECT VISION

Visibility is an obvious necessity in orthodontics, and it is necessary to have direct vision when applying brackets and wires, and when direct visibility is not possible, it is important to use mirrors.

A common position that can make visibility an ergonomic problem is sitting at 7 o'clock. This is a challenging position for the clinician, as it requires the patient to turn and face the operator, and if the patient does not turn their head to look directly at the clinician, the operator must compensate form and position by bending and leaning over the patient to gain visual access. Sitting at 12 o'clock is a more favorable and comfortable position, since it allows the patient to lift their chin to give direct visibility, eliminating the need to bend and twist. (Fig. 2) A rolled neck pillow under the patient's shoulders will also help by propping the



patient's head with the chin up, allowing for patient comfort and support, while the operator has direct visual access. (Fig. 1)

When direct visibility is not possible or continues to be limited, despite adjustments to positioning, use your mirrors! Be proficient using mirrors, instead of choosing to bend and twist when viewing the patient, which can compromise a clinician's musculoskeletal health.

ROOM LAYOUT

Room layout is often determined by the designer, architect, and practice owner and often cannot be changed. When the room layout is a challenge, it is best to think critically, assess, and plan to leverage the best possible ergonomic outcome.

Mobile carts, a common piece found in dental practices, have multi-purposes, such as organizing supplies, holding hand pieces, and placing trays. Mobile carts, although handy and useful, can be an ergonomic issue if not set up correctly for the clinician. Do not be afraid to move things if the cart does not allow for a comfortable work experience or gets in the way or is positioned right when it should be left or vice versa. It may be necessary to change the position of the cart!

Televisions are commonly placed in the operator for educational videos and patient distraction. Unfortunately, television placement can also dictate patient head placement. Televisions placed on the left side of the operator can contribute to the patient's head being positioned away for the right-handed operator, causing the operator to bend over the patient to reach and



Fig. 2

view. Aim to place televisions on the right side of the room for right-handed operators and left side of the room for left-handed operators.

ASK AND INVEST IN YOURSELF

We all come in different shapes and sizes, and one size does not fit all; the reality is, whether you are joining a brand new practice or an existing practice, a 'clinician specific operator' is often not an available option, for many practitioners. Often what is provided to many clinicians may not be the best for you, your body, and your needs. Since the majority of instruments, equipment, and furniture have been provided and determined by the practice owner it is important to make sure your work space is ergonomically set up for you.

In this modern age of technology, there are many tools, aids, and equipment available to help you work ergonomically. If you have predetermined needs, and instruments, equipment, and furniture have already been made available to you in the office you are working in do not be shy to ask your employer for what you need or make suggestions- it's worth asking! If this is not an option, invest in yourself- in the long run, it will allow for better effectiveness and efficiency, with better ease and comfort for you as you do your work.

USE A CHAIR THAT MEETS YOUR SPECIFIC NEEDS

Without a good chair, dentistry can be difficult on the body! If a chair lift is too tall, it does not allow the operator's feet to touch the ground when working. If too small, it does not provide the support needed for the clinician.

Fig. 3



Regardless, if too small or too big for a clinician, a poor chair choice compromises posture when providing patient care. Gone are the days of the generic operator dental chair! There has been a shift in furniture design to cater to both male and female clinicians. Patients and clinicians come in many shapes and sizes, and manufacturers now understand one size does not fit all. A chair that fits you puts less stress on the body and provides effectiveness and efficacy when working. One of these ergonomic friendly chairs is the saddle chair. (Fig. 3)

This chair allows and encourages upright posture by forcing the pelvis into a neutral position, thus not allowing slouching to be an option. Also, remember to choose a chair that is adjustable and is the proper height. It does not matter which chair you get, as long as it fits your specific body and needs.

MAGNIFICATION

Working in a small space with limited visibility is the nature of orthodontics and dentistry. Magnification is becoming the standard in dentistry, due to the value it provides in visibility and clinician positioning. Loupes contribute to ergonomic health while performing orthodontic procedures by controlling the focal distance and blur when we are trying to view tiny brackets from a closer distance, and fine, intricate work is being done. (Figs. 4 & 5) There are many magnifications available, although a low

Fig. 4



power 2.5x should have a field width able to view the entire mouth. Also consider a loupe or frame mounted lighting to eliminate the repetitive motion of adjusting the overhead light.

LIGHTING

Repetitive motion is necessary when using overhead lighting. Hands-free lighting, attached to your loupes or glasses, will give you direct shadow free illumination. (Figs. 6 & 7) Clip on LEDs are not available in cable free versions. From an ergonomic standpoint,

cable free lights eliminate the distraction of the cable attached to a battery. If you have a cable, keep the cable inside your lab coat or scrub shirt to prevent the cable from becoming accidentally caught on projections.

Posture Coaching. The LumoLift is the new kid on the block in the ergonomic world. This gyroscope device gives feedback on posture habits during the work day. The LumoLift can be programmed to vibrate, giving feedback when an operator bends forward and keeping the clinician accountable to good

Fig. 5

Loupes promote healthy ergonomic posture- Reducing neck and back strain



positioning. This device can be programmed to the clinician's specific needs and allows for Bluetooth/cell phone history reference.

"BOOMER" OR "THE DENTAL RAT"

The Dental Rat is a foot controlled mouse and keyboard that accommodates multiple rheostats. (Fig. 8) This unique device allows multiple equipment to work off a single foot controlled mouse, eliminating the need for multiple rheostats and devices. The Dental Rat helps with viewing patient charts and documenting, allowing for hands-free perio charting. It is compatible with many computer programs and minimizes the chances of cross-contamination.

MAINTAIN ORDER IN THE OPERATORY

No surprise here, organization is the foundation of ergonomic health for a clinician. Other simple, yet effective, things you can do in the operatory include:

- Eliminate cords that are constantly pulling.
- Keep instruments sharp.
- Provide adequate lighting.
- Get rid of broken stools.
- Eliminate improperly functioning equipment.
- Fix drifting lights and x-ray head.
- Unclutter and control the placement of equipment and supplies.

BE PRO-ACTIVE IN HEALTH

Pain-free work and longevity in dentistry also requires work outside of the operatory. It is always easier to prevent than it is to restore; exercise is a key for all dental clinicians and should be made a part of ergonomic and systemic wellness.

Exercise is especially important for women in dentistry. Men and women are anatomically and structurally built differently. Men are more muscular and have more of a supportive structure, while women are typically shorter and have 1/3rd less musculature. These differences



in anatomy and muscle structure between the sexes become evident, as women are more prone to musculoskeletal problems and work related injuries due to poor stabilization.

Exercise maintains healthy muscular strength and flexibility and prevents stiffness from working in stagnate positions at the dental chair. Resistance training with weights or elastic bands can be beneficial to maintain and develop muscular strength for the postural stabilizing muscles of the trunk and shoulders, allowing for proper and better posture. Yoga is another beneficial form of exercise for dental professionals and has been shown to contribute to strength, balance, flexibility, and relaxation.

One of the key factors in being

proactive as a dental professional is to remember early detection and intervention is truly protection! If any pain, stiffness, or discomfort is present, it is important not to ignore it. Many clinicians will admit to ignoring the pain, hoping it will go away on its own, and continuing to work compromised for years. This may lead to a preventable musculoskeletal problem. If you are experiencing muscular fatigue, speak to your physician early, as the pain may be caused by weak postural stabilizing muscles; also, ask your team/co-workers to monitor and take photographs of how you are working. This will provide a different set of eyes on how you work and help identify solutions and suggestions to help you practice healthier.

There are no shortages of challenges working in a dental practice.- From working in the small oral cavity with difficult to reach areas and patients who come in different sizes and with different needs, to room layout and not controlling the equipment sizes in the office. All these factors can take a toll on a dental professional, mentality and physically. The goal is not only to take care of our patients, but ourselves. By being cognizant of working positions, being proactive, and taking advantage of ergonomic advancements, a clinician can enjoy a long, satisfying, pain and injury-free career in dentistry and continue to produce beautiful, healthy smiles for many years to come.

