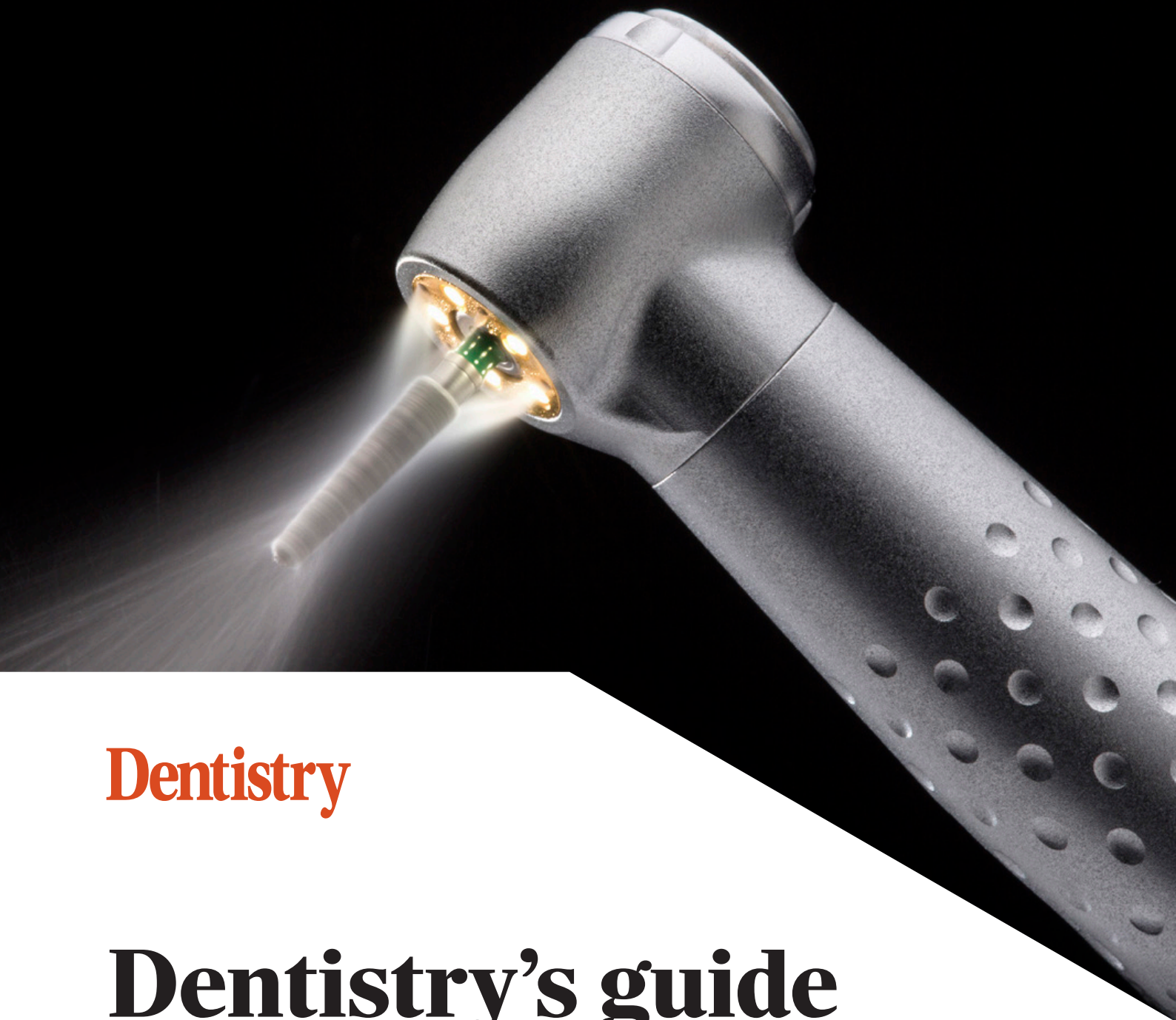




Dentistry

Dentistry's guide to handpieces

Dental handpieces: what really matters?

Choosing a dental handpiece is about much more than speed. From ergonomics and precision to patient comfort, maintenance and longevity, the right handpiece can make a real difference to both the clinician and patient experience.

So, what should you consider before choosing your next one?

Explore your guide to choosing well →







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Overview and advancements in handpiece technology

From high- and slow-speed models to electric, endodontic and surgical systems, today's handpieces combine greater control, comfort and versatility. Here, we explore the key types and technologies shaping modern clinical practice.

The dental handpiece has long been an essential tool in all practices. Engineered to elevate precision in restorative, endodontic and surgical procedures, technological progress continues to meet the demand for more ergonomic, efficient and user-friendly handpieces.

High-speed versus slow-speed handpieces

A high-speed turbine is primarily used for cutting tooth structure and finishing restorations. Its main advantage lies in its ability to cut through tough materials quickly due to its high revolutions per minute (RPM). However, it typically operates with lower torque, making it more effective for tasks that require speed rather than force. It operates at speeds up to 400,000 RPM.

A slow-speed contra-angle is better suited for more delicate dental procedures, such as removing soft decay and preparing cavities. Although it operates at a lower RPM, it offers higher torque, allowing greater control and precision during



Technological progress continues to meet the demand for more ergonomic, efficient and user-friendly handpieces



Their versatility means they can perform both high-speed and slow-speed tasks, reducing the need for multiple tools and making them suitable for a wide range of dental treatments

intricate work. This makes it ideal for tasks that demand careful attention and accuracy. It operates at speeds up to 40,000 RPM.

**Electric handpiece
(speed increasing contra-angle)**

This offers significant advantages in dental procedures, particularly with its torque and speed control. This capability allows for more precise cutting, which is crucial for complex procedures. Its versatility means it can perform both high-

speed and slow-speed tasks, reducing the need for multiple tools and making them suitable for a wide range of dental treatments.

Electric handpieces generate low noise levels, enhancing the patient experience by reducing anxiety and discomfort and creating a more pleasant working environment. Its precision is invaluable in challenging situations, such as working in tight spaces or with paediatric patients, where control and accuracy are paramount. Whilst the initial outlay is higher, its precision, versatility and patient comfort benefits

often make it a worthwhile investment for dental practices.

Contra-angle handpiece

Commonly used with air motors or an electric micromotor, its ergonomic design allows improved access to posterior teeth. The angled head of the handpiece enables the dentist to work in the confined spaces at the back of the mouth more effectively, ensuring precise treatment even in challenging areas. This design is particularly beneficial when working with patients with limited mouth opening or accessing the molars, where



direct visibility and access are often restricted.

Straight handpiece

This handpiece, characterised by its straight, non-angled design, is often used in lab work and is ideal for tasks that require precision and stability, such as adjusting prosthetics or performing intricate detail work. Its design allows for greater control and accuracy, making it indispensable when angled or curved handpieces are less effective.

Endodontic handpiece

This handpiece is designed explicitly for performing root canal treatments and is typically engineered to operate with either a reciprocating or rotary motion, allowing for effective root canal cleaning and shaping.

It also incorporates several ergonomic features that enhance control and comfort during lengthy procedures. They often come with adjustable speed settings and torque controls to accommodate different types of files and canal complexities, reducing the risk of damage to the surrounding tissues.

Surgical handpiece

Engineered to withstand the demands of surgical environments, where high torque and consistent performance are critical, this handpiece is often equipped with specialised attachments, such as surgical burs,



which allow for intricate bone cutting and soft tissue management. The design also typically incorporates advanced cooling systems to prevent overheating during extended use, ensuring patient safety and comfort. The enhanced torque of these handpieces allows for efficient cutting through dense bone and other hard tissues, reducing the time required for surgical interventions. Their versatility is further enhanced by the ability to accommodate a variety of attachments, making them

suitable for a wide range of oral and maxillofacial procedures.

Summary

Technological innovations have significantly transformed the dental handpiece market. Modern handpieces are designed to offer superior performance, enhanced ergonomics and outstanding durability. Advancements such as electric handpieces, improved turbine technology, and the integration of LED lights have revolutionised dental procedures, providing better precision, control and patient comfort. From noise reduction to advanced cooling systems, the evolution of handpiece technology is reshaping the future of dental care. ■

Advancements such as electric handpieces, improved turbine technology, and the integration of LED lights have revolutionised dental procedures

Top considerations when purchasing a dental handpiece

When choosing a handpiece, significant factors include ergonomic design, power source, compatibility with existing equipment and the frequently performed procedures. By making an informed decision, you can enhance your practice's capabilities and provide superior care to your patients. **Here, we explore some areas for consideration.**

Edmund Proffitt

Chief executive of the BDIA



Trusted sources

The first consideration for any surgical equipment is its origin. Given the prevalence of online purchasing, due diligence is crucial to verify the reliability of suppliers.

Reputable suppliers build trust through transparency and should readily answer questions such as:

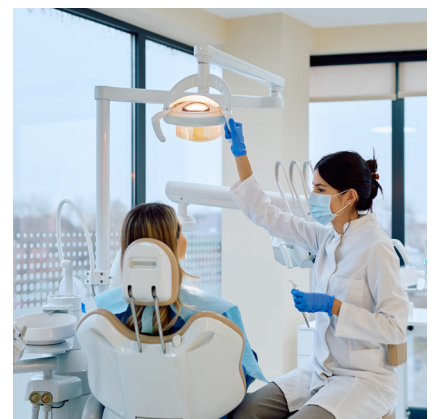
- Is the device CE-certified for safety compliance?
- Is it from an ISO 13485-certified manufacturer?
- Does a UK-based provider supply it?
- Does it include a warranty?

Edmund Proffitt, chief executive of the BDIA, has previously warned of the risks of buying counterfeit dental equipment, suggesting that products such as handpieces are widely counterfeited and often sold through sites such as Amazon and Ebay.

'The fakes are growing in sophistication. They appear to have CE marks, bar codes, serial numbers and holographic labels – all counterfeit. Even the accompanying

documentation is expertly forged to be indistinguishable to the untrained eye,' he warns.

The BDIA suggests it is essential to get to know suppliers. 'BDIA members adhere to a strict code of practice, which can give dentists the confidence that the products they buy are guaranteed quality and provenance. The bottom line is to buy from reputable suppliers and know where your product is coming from. It is not worth risking your patients' or staff's safety or





professional registration. Remember the adage: if the price is too good to be true – it probably is.'

Compare different handpieces on the market for their strength and longevity. Seek recommendations from colleagues who can provide invaluable insights and visit the manufacturers' websites. Dental shows and exhibitions often offer opportunities to test out the latest

advancements in handpiece technology. Investing in genuine equipment guarantees the safe delivery of patient care and minimises interruptions caused by frequent breakages or replacements.

Ergonomics and practitioner comfort

Whilst personal preference plays a significant role in choosing dental equipment, practitioners should be

mindful of their health and wellbeing. The ergonomics and weight of a handpiece are crucial to preventing repetitive strain injuries and musculoskeletal disorders. An ideal handpiece is a slim, lightweight one that reduces fatigue during lengthy procedures.

The bottom line is to buy from reputable suppliers and know where your product is coming from. It is not worth risking your patients' or staff's safety or professional registration





There are very few scientific studies on the impact of dental handpieces on user health. However, a 2014 paper emphasised the need for manufacturers of manual instruments to prioritise designs that accommodate clinicians' variability (Migliario et al., 2014). Instead of focusing on 'refined colours' and 'attractive design', they write that developing tools based on specific characteristics tailored to each practitioner's unique needs is crucial. This approach can help mitigate risk factors associated with improper grip.

Patient comfort

Whilst the dental environment comes with a degree of unavoidable noise, minimising impact for greater patient comfort is essential. As well as exacerbating anxiety in phobic patients,

it is also widely accepted that noise during clinical dental practice creates negative emotions in the clinicians and

dental staff, such as nervousness, loss of concentration and restlessness. High-torque electric handpieces work faster





and more precisely, reducing chair time and noise levels – particularly beneficial for more anxious patients.

Technological advancements

Ease of use is vital for efficient and high-quality dentistry, so handpieces that are easy to install and operate appeal. Reliability and consistency in performance are also important factors. However, how manufacturers respond to the demand for more innovative solutions within dentistry can make the difference between good performance and great performance. A company

that invests in new technology will consistently deliver for practitioners. Stay updated with the handpiece technology by reading about the topic. Research and apply any innovations that could enhance your practice and clinical delivery and set you apart.

Decontamination

Dental handpieces, like any dentistry equipment, require stringent cleaning to prevent cross-infection. High hygiene standards are necessary to ensure patient safety and compliance with regulations. The materials must

endure frequent sterilisation without corroding or degrading, maintaining durability and performance.

High-grade stainless steel and specialised polymers are standard for their resistance to wear. Proper maintenance should adhere to health standards and extend the handpiece's lifespan, reducing downtime and enhancing cost-effectiveness for the practice.

After-sales service

Support and servicing are critical when selecting dental handpieces, as even the most durable require professional care to ensure longevity. Handpieces are precision instruments subjected to intense use, and without proper maintenance, performance can degrade over time. This can affect the quality of dental procedures and may lead to costly repairs or replacements. Therefore, check if the supplier offers a reliable repair service. Remember, efficient turnaround times are essential in minimising downtime.

A comprehensive warranty can also provide peace of mind. Check terms and conditions, such as what is covered and for how long, to help you make an informed decision. Beyond the initial purchase, good quality handpieces that are well-maintained can significantly reduce unnecessary expenses over time. Regular servicing and the supplier's reputable repair centre ensure your investment remains in optimal condition for as long as possible. ■

Handpieces are precision instruments subjected to intense use, and without proper maintenance, performance can degrade over time

Buying guide

Explore W&H's range of straight, contra-angle and surgical handpieces, with options designed to support a wide variety of restorative, surgical and specialist procedures.



W&H

W&H offers an extensive portfolio covering a full raft of treatments.

Buying considerations

When choosing a handpiece, consider the type of instrument required, how it is powered, its operating speed and illumination, and

the procedures for which it will be used.

Air or electric

The one you choose will determine speed and usability. Air-driven handpieces have a higher speed with lower torque, are lighter, easier to handle and smaller in head height than those using electric motors.

Speed-increasing handpieces from W&H are reliable, efficient, and easy to use. They have been designed to ensure minimal aerosol production and quiet running. Used in conjunction with an electric motor, it runs at maximum speeds of 200,000 rpm while

offering impressive torque, control and precision.

LED+ illumination

Handpiece illumination is important, with enhanced LED offering daylight grade illumination. This means eye strain is reduced and visibility improved, providing better colour definition, contrast and reduced heat.

Decontamination

Decontamination is an essential part of practice, with instruments reprocessed multiple times a day. Only a quality-made handpiece, designed with sterilisation in mind, is able to withstand a demanding routine without compromising on functionality or performance. W&H handpieces are designed to be thermo washer disinfectable and sterilisable.

Turbines

Synea turbines offer high speed with low weight, and all have a hygienic head



anti-retraction system to prevent cross contamination by minimising aerosol.

Synea Vision Turbines

- Four head sizes available including: TK-94 L micro turbine, ideal for paediatric dentistry and harder access areas
- LED+ shadow free illumination for enhanced visibility
- Five-port spray for exceptional cooling
- Up to 410,000 rpm.

Synea Fusion Turbines

- Two head sizes available
- Available with and without LED+ illumination
- Four-port spray
- Up to 390,000 rpm.

Straight and contra-angle handpieces

The Synea series includes two handpiece ranges, offering user comfort, innovation and long service life.

Synea Visions

- A full range of speeds, from 2:1 speed reducing to 1:5 speed increasing
- Speed reducing handpieces require an electric motor
- Practical stainless steel design and protective coating
- Outstanding, compact glass rod illumination
- Effective cooling
- Easy bur change
- 36-month warranty.

Synea Fusion

- A full range of speeds, from 2:1 speed reducing to 1:5 speed increasing to suit your treatment needs
- Speed reducing handpieces, requiring an electric motor
- Excellent cooling
- Compact glass rod for constant light quality
- Secure grip and easy bur changes
- 24-month warranty.



Synea Power Edition

These durable 1:4 high-speed contra-angle handpieces are designed for heavy-duty applications, including removal of fillings, crowns and bridges, and high strength materials like zirconia.

- Available with and without LED+ illumination
- Three-port spray for cooling
- Up to 160,000 rpm.

Surgical handpieces

W&H's ergonomic, stainless steel surgical handpieces with a scratch resistant coating make them robust and give them a long service life. They are available with mini LED+ and self-generating LED for use on non-optic units.

- Ideal LED illumination with natural reproduction of red tones
- A full range of surgical handpieces available from standard straight and

contra-angles to WS-91 with 45° head and SZ-75 a specialist zygomatic handpiece

- Speeds, from 20:1 to 1:2.7 for treatment indications including apical resection, osteotomy, apical trepanning and bone modelling
- External spray available
- Can be dismantled for thorough cleaning.

Prophy handpieces

The Proxeo range of prophy handpieces are designed for the mechanical removal of plaque and biofilm

- 4:1 contra-angle and straight available
- Universal for screw in and snap on cups and brushes. ■

To find out more, scan the QR code or visit www.wh.com.





Your next steps

From performance and compatibility to maintenance, warranty and after-sales support, careful consideration will help you choose a handpiece that suits your clinical needs and delivers lasting value.

Advanced dental handpieces are designed to deliver precision, reliability and efficiency, allowing you to perform procedures with greater accuracy and less fatigue. This improves the quality of care you provide and enhances the overall patient experience by reducing treatment times, minimising discomfort and ensuring smoother, quieter procedures.

Investing in a dental handpiece requires careful consideration of several factors to ensure you get the best value for your money. Key aspects to remember include the handpiece's power source (electric or air-driven), speed and torque, maintenance requirements and warranty.

Navigating the purchasing process can be challenging, but by conducting thorough research, seeking peer recommendations and testing handpieces before purchase, you can ensure you invest in a handpiece that is best for you – and your clinical work.

Common pitfalls are prioritising price over quality, neglecting to check compatibility with existing equipment, and overlooking the importance of warranty and service agreements.

By adhering to these guidelines, you can make a well-informed purchase that enhances your practice. ■

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