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Review Article

A Primer on Non-Clinical Opportunities for the Innovative Orthopaedic Surgeon

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Orthopaedic surgeons are well-positioned as experts in the diagnosis and treatment of musculoskeletal injuries and pathology. There are opportunities that exist in addition to clinical practice in which surgeons can utilize their expertise. These skillsets can be applied toward non-clinical pursuits such as entrepreneurship, consulting, ancillary service management, real estate, and medical device investing. In this article, we discuss these opportunities and how orthopaedic surgeons can apply their clinical acumen in an innovative way.

INTRODUCTION

Orthopaedic surgeons regularly utilize their ingenuity and critical thinking skills in clinical settings, whether in the clinic, emergency department, or operating room. Additionally, following 14 years of training – 4 years of undergraduate education, 4 years of graduate medical education, 5 years of postgraduate residency training, and 1 year of fellowship training – orthopaedic surgeons are unequivocally subject matter experts in their field. This combination of creativity and knowledge makes orthopaedic surgeons inherently innovative and well-positioned for entrepreneurial success (Campbell et al. 2018; Maher et al. 2019). However, few orthopaedic surgeons leverage and utilize their unique expertise outside of their clinical practice.

While side hustles may require time and effort, they can also have numerous benefits, including the ability to make a broader impact on healthcare, create supplemental in-

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come streams, utilize small business tax deductions, increase retirement savings, gain more favorable tax treatment, and curtail physician burnout (Yee, Steel, and Bhargava 2020). The purpose of this article is to provide a primer for innovative orthopaedic surgeons interested in leveraging their expertise in non-clinical pursuits, including entrepreneurship, consulting, ancillary service management, real estate, and medical device investing.

ENTREPRENEURSHIP

There are various ways that innovative orthopaedic surgeons can participate in the entrepreneurial ecosystem, including developing their personal brand, taking advantage of intrapreneurship opportunities, and starting their own company.

DEVELOPING A PERSONAL BRAND

Orthopaedic surgeons can build their personal brand through websites, blogs, newsletters, social media, speaker arrangements, and professional appointments. By marketing themselves as experts in their field, these orthopaedic surgeons can establish credibility outside of the clinical setting. Social media can be a valuable tool for surgeons to share information with patients as numerous studies have discussed the role of social media in patient care for both academic and private practice orthopaedic surgeons (Varady et al. 2019; Lander et al. 2017; Haeberle et al. 2019, 2017; Karnuta et al. 2020; Ramkumar, Navarro, Chughtai, et al. 2018; Ramkumar, Navarro, Cornaghie, et al. 2018; Ramkumar, Navarro, Haeberle, Chughtai, Demetriades, et al. 2017; Ramkumar, Navarro, Haeberle, Chughtai, Flynn, et al. 2017). Orthopaedic surgeons can leverage a prolific social media presence to attain prestigious appointments, attract consulting opportunities, and increase clinical demand in their practice. Various social media platforms, such as Instagram, Twitter, and TikTok, have enabled orthopaedic surgeons to build a follower base with whom they can readily share content. Those interested in establishing a social media presence should leverage the platform that fits best with their skills and post regularly to keep their audience engaged. Some surgeons may even be able to monetize a prolific social media presence through advertising, affiliate marketing, and selling products. However, given the constantly evolving nature of social media, it may be challenging to keep up with the newest trends and etiquettes and adapt to new platforms as they gain popularity. Overall, leveraging social media can be a great opportunity for surgeons interested in content creation, marketing, and digital technology.

INTRAPRENEURSHIP OPPORTUNITIES

Orthopaedic surgeons working at large institutions are often able to take advantage of intrapreneurship opportunities within their organizations (Chamorro-Premuzic 2020). This may include working with an innovation center, accelerator, or incubator associated with a healthcare system. In these roles, surgeons often serve as subject matter experts on interdisciplinary teams with research scientists, engineers, software developers, product designers, and physicians of other subspecialties to develop and commercialize new products, techniques, and devices. For example, during the COVID-19 pandemic, orthopaedic surgery resident physicians in New York City developed and validated a prone positioning tool alongside industry partners for intubated patients in the intensive care unit (ICU) (Rahman, Zbeda, and Romeo 2021). Intrapreneurship opportunities can be especially beneficial for surgical trainees and academic orthopaedic surgeons who have the backing of large institutions, potential grant funding, designated administrative time, and research personnel support. While some initial work with innovation centers may be unpaid, it could ultimately result in an academic appointment, a formal advisory role, additional grant funding, or royalties. Outside of the institution, some surgeons may also be able to leverage these experiences to gain lucrative external consulting opportunities.

STARTING YOUR OWN COMPANY

Some orthopaedic surgeons may also choose to venture into the entrepreneurial ecosystem by starting their own company (Campbell et al. 2018). This approach presents the highest level of risk but also can generate the highest reward. Starting a company, while difficult and time-consuming, can also provide the surgeon with personal, professional, and financial benefits. Personally, starting a business can be very gratifying. It can allow surgeons to make a broader impact on healthcare, achieve lifelong goals, and avoid burnout in their clinical practice. Professionally, starting a company could make a surgeon an expert in a particular niche and allow them to grow their personal brand. Financially, surgeons can benefit twofold from operating a small business. Not only would they increase their total earnings from business profits, but they can also qualify for small business loans, write off business expenses, and receive better overall tax treatment. Orthopaedic surgeons interested in starting their own business should make sure that they understand not only the competitive landscape, but also the necessary monetary and time commitment. Fundraising, specifically, which is essential to success, requires a unique skillset and can be very time intensive. Entrepreneurship can be a fulfilling endeavor for innovative, business-savvy orthopaedic surgeons who are in tune to the pain points of clinical practice and skilled at devising creative solutions to problems as they arise.

CONSULTING

As subject matter experts, orthopaedic surgeons are in a unique position to provide their expertise in both clinical and non-clinical settings. Consulting as an orthopaedic surgeon allows one to make an impact beyond the individual patient. By providing clinical insights on orthopaedic pathology and treatments, surgeons can make a difference at the individual, institutional, and societal level. Such en-

gagements come in many forms including serving as an external consultant, internal advisor, third-party consultant, or medicolegal expert.

EXTERNAL CONSULTING

As an external consultant, the orthopaedic surgeon can establish his or her own company, usually in the form of a limited liability company (LLC) and provide clinical insights to clients. In this way, surgeons can diversify their income stream and tailor their services in a unique way that mirrors their clinical practice and allows them to build their personal brand. These engagements can include providing insights on anterior cruciate ligament (ACL) biomechanics and pathophysiology, a literature review on conservative treatment options prior to a total knee replacement, or clinical anecdotes on the use of emerging biologic therapies such as platelet-rich plasma and stem cell injections. Extensive surgical training allows for a comprehensive understanding of certain medical devices and implants, surgical techniques, and day-to-day operations. This can translate to innovating surgical devices, optimizing techniques through industry demonstrations, and providing insights on surgical workflow and processes within a hospital or ambulatory surgical centers (ASCs). Consulting opportunities of this type can be found organically through word of mouth, by attending formal networking events, or via online listings such as that on the Drop Out Club website. A consulting or advisory business can be an opportune way for innovative orthopaedic surgeons to build additional income streams, make widespread impacts on their field, and take advantage of small business tax deductions.

INTERNAL ADVISING

Orthopaedic surgeons can also become advisors by being directly employed by medical device, pharmaceutical, digital health companies, or consulting firms. Through these arrangements, surgeons may serve on committees, governing bodies, and advisory boards. Regardless of whether they are compensated in dollars or company shares, these surgeons have the unique opportunity to drive innovation from within a company and make large-scale, longitudinal impacts. Unlike external consultants, who are typically paid an hourly rate for specific expertise on a niche topic, advisors direct organizational objectives and drive investment toward what they believe to be fruitful projects. Of note, these roles can be challenging since they require skills that are not formally taught in medical training. While most soft skills, such as leadership, team communication, division of labor, and time management, are transferable, some hard skills may need to be learned. This includes basic competency around the development of presentation decks, quantitative financial analysis, and qualitative business reasoning. Internal advising opportunities are scarce but can be a rewarding way for orthopaedic surgeons with formal business training to leverage their diverse knowledge base to make a meaningful impact on a specific company.

THIRD-PARTY CONSULTING

As a third-party consultant, orthopaedic surgeons can be hired ad-hoc to provide clinical reports to firms involved in venture capital, private equity, or to third-party research organizations such as GuidePoint or GLG. These opportunities are a form of locum in the business world for companies to obtain clinical expertise for specific projects they are evaluating. For example, a venture capital firm evaluating an investment in a new surgical robot for joint replacements may seek advice from a surgeon who utilizes the MAKO robotic-assisted system (Stryker, Kalamazoo, MI). These third-party opportunities provide some flexibility to orthopaedic surgeons' schedule as they can continue to engage in musculoskeletal advising while maintaining clinical responsibilities.

TRIAL LAW ADVOCACY

In trial law advocacy, orthopaedic surgeons are employed by attorneys to serve as subject matter experts on relevant court cases, such as those involving medical malpractice, personal injury, and worker's compensation (Carroll and Wellman 2011). These roles often require diligent reading of the current literature and evaluation of standard of care. For orthopaedic surgeons, this means that they must be up to date on the relevant Standards of Professionalism issued by the American Academy of Orthopaedic Surgeons (AAOS). In fact, expert witnesses are subject to disciplinary action from professional organizations for their legal work, so it is essential that they are well-informed (Bal 2009). Expert witness work is often well-compensated on an hourly basis and regular reading of orthopaedic literature could also serve the surgeon well in his or her clinical practice.

Worker's compensation is a unique type of trial law advocacy since it requires that the orthopaedic surgeon perform an independent medical examination (IME). An IME is a medical exam performed by a licensed professional to provide the insurer or legal representative with an independent opinion related to the injury and treatment. The IME allows patients to ask questions regarding their worker's compensation claim and can aid them in the decision making process regarding their treatment, rehabilitation, and entitlements to compensation. Orthopaedic surgeons who are interested in medicolegal work should seek out educational opportunities on the topic, contact those who are currently working in these roles, and network with local attorneys.

ANCILLARY SERVICE MANAGEMENT

To complement their clinical practice, orthopaedic surgeons may have the opportunity for horizontal integration through ownership of ancillary services, most commonly imaging services, rehabilitative services, durable medical equipment (DME), and orthopaedic urgent cares. Other potential ancillary services include electromyography (EMG), in-house pharmacy, automated conditioned plasma (ACP) centrifuge, and in-office diagnostic needle arthroscopy

(Bert 2002; McMillan 2020; Bert 2008). While physician reimbursement continues to decrease over time, facility fees from ancillary services present an opportunity for surgeons to recoup some of this lost income (Bert 2008). Since the surgeon's earnings from ancillary services are classified as "facility fees", they are not prohibited by the Stark I and II laws and Safe Harbor regulations as long as the ownership is structured appropriately (Bert 2002). This is known as the in-office ancillary services (IOAS) exception, which allows physicians to profit from these services as long as their earnings are not dependent on who ordered the service (Beach et al. 2002).

While there are many opportunities to take advantage of ancillary services in orthopaedics, surgeons must balance maximizing revenue streams with maintaining an efficient clinical workflow. From a strictly financial standpoint, the success of adding ancillary services is based on patient volume. Ancillary services have been shown to increase overall profits geometrically since fixed expenses can be shared with the orthopaedic practice and the increase in revenue far outweighs the increased variable expense at high patient volumes (Bert 2003). In fact, one study found that integrated ancillary services can significantly reduce group overhead between 10 and 30% (Small 2000). Prior to acquiring new services, orthopaedic surgeons should conduct cost-benefit analyses or hire professional consultants to evaluate new opportunities. From a patient care lens, having in-house ancillary services allows the orthopaedic surgeon to better direct patient care and has the potential to create various efficiencies and economies of scope that decrease healthcare costs and improve patient outcomes (Schneider et al. 2012).

IMAGING SERVICES

One of the most synergistic ancillary services in an orthopaedic practice is the incorporation of in-house imaging services, including ultrasound, X-ray (XR), DEXA scanner, computed tomography (CT), and magnetic resonance imaging (MRI) (Bert 2008). Surgeons are able to review and bill for their own radiographic interpretations and can confirm readings with either a teleradiology service, national reading organization, or a local radiology group. This not only allows for better care coordination, but also allows surgeons to choose which radiologist they would like to read a particular MRI, for example, to ultimately deliver better patient care (Bert 2002). Equipment can be co-owned through an equipment joint venture, or a lease could be set up with a local imaging center. Given the extensive usage of radiographic imaging in the diagnosis and management of orthopaedic pathologies, in-house imaging services offer a unique opportunity to seamlessly integrate ancillary services, improve operational efficiency, and generate residual income (Bert 2008).

REHABILITATIVE SERVICES

Rehabilitative services, such as physical therapy (PT) and occupational therapy (OT), present other opportunities to incorporate ancillary services into an orthopaedic practice. Co-ownership of a PT practice can significantly improve care coordination for patients pre- and post-operatively by increasing communication between providers and creating a bidirectional exchange of knowledge (Schneider et al. 2012). One study found that orthopaedic surgeons who worked closely with physical therapists were more likely to recommend non-surgical treatment options to their patients (Aiken et al. 2008). This concept is further substantiated by a military study conducted during Operation Iraqi Freedom that demonstrated the benefits of colocation of orthopaedic surgeons and physical therapists in the treatment of musculoskeletal ailments (Davis, Machen, and Chang 2006). Alternatively, orthopaedic surgeons may choose to integrate virtual PT services into their practice. Many practices began to adopt virtual PT services in the height of the COVID-19 pandemic. Previous studies have demonstrated that virtual PT has comparable efficacy to in-person therapy for musculoskeletal disorders and that telerehabilitation services can be very effective in the post-operative period (Phuphanich et al. 2021; Miller et al. 2021; Grundstein et al. 2021; Hall, Luechtefeld, and Woods 2021; Hall, Woods, and Luechtefeld 2021; Grundstein, Sandhu, and Cioppa-Mosca 2020).

DURABLE MEDICAL EQUIPMENT

Durable medical equipment (DME), such as orthotics and prosthetics, are another opportunity for orthopaedic practices to incorporate ancillary services. Similar to other ancillary services, the success of a DME business is almost entirely driven by patient volume. Therefore, orthopaedic surgeons should perform an in-depth market opportunity analysis prior to integrating a DME business into their practice. Additionally, since DME is a commodity, there are numerous options on the market and surgeons must decide which ones they would like to sell in their practice. In making these decisions, they should consider quality, cost, inventory control, and reimbursement. This becomes especially important in larger orthopaedic practices with multiple locations. Supply and demand analyses, new billing requirements, and the need for storage space can create additional logistical challenges for the practice. Instead of buying their DME outright, some orthopaedic practices may also consider a "stock and bill" approach or shared revenue model with an existing DME manufacturer. While these business models may only add marginal revenue to a practice, they allow for improved patient access to DME and can better coordinate patient care (Bolesta 2008).

ORTHOPAEDIC URGENT CARE

Musculoskeletal complaints make up between 17% and 26% of all emergency department cases (MacKechnie et al. 2020; de Inocencio et al. 2016; J. Edwards et al. 2017; Shah et al. 2007). Orthopaedic urgent cares present another opportunity for ancillary services to be incorporated into an orthopaedic practice. These urgent cares are typically staffed by physician assistants (PAs) with overseeing surgeons on-call in case of an emergency. Previous studies have demonstrated the efficacy of orthopaedic urgent cares for both ini-

tial management of new injuries and for the management of post-operative complications. In a retrospective review evaluating the efficacy of a dedicated musculoskeletal urgent care, Anderson and Althausen found that the urgent care treatment reduced costs to the health care system by $97.8 million. Urgent care profit over the 12-month study period was $8.6 million (Anderson and Althausen 2016). In the post-operative period, one study by Chaudhary et al. found that orthopaedic outpatient care resulted in significantly lower odds (odds ratio = 0.73) of emergency department (ED) utilization within 90 days following total joint arthroplasty (TJA). This study also found a positive correlation between high ED utilization and increased index hospital length of stay, medical comorbidities, and post-operative complications (Chaudhary et al. 2018). Previous studies have demonstrated 30-day post-operative ED utilization rates of 5 to 10% following TJA (Chaudhary et al. 2018; Finnegan et al. 2017). By offering these services in-house, orthopaedic practices can increase their practice's top line revenue, reduce overall healthcare costs to the patients, and better direct patient care. During the COVID-19 pandemic, orthopaedic walk-in clinics grew in popularity and proved efficacious in treating patients due to their ability to reduce the burden on EDs. Some practices even employed telemedicine and virtual fracture clinics (Murphy et al. 2020). Nonetheless, patient care models around these new adjuncts should be further developed before their widespread adoption.

REAL ESTATE

Some orthopaedic surgeons may also have unique opportunities to invest in real estate assets that are not otherwise available to the lay investor, such as ambulatory surgery centers (ASCs), hospital outpatient departments (HOPDs), and medical office buildings (MOBs). Additionally, orthopaedic surgeons may choose to invest in non-medical real estate through direct ownership or via limited partnerships with professional operators.

OUTPATIENT SURGERY CENTERS

In recent years, there has been a substantial increase in the volume of orthopaedic procedures performed at outpatient surgery centers, including both hospital outpatient departments (HOPDs) and ambulatory surgery centers (ASCs). This shift is attributable to the ability of outpatient surgery centers to produce equivalent patient outcomes at lower costs. Numerous studies have demonstrated the safety of various orthopaedic surgeries at outpatient surgical centers, including pediatric (Rider et al. 2018), hand and upper extremity (Goyal et al. 2016), foot and ankle surgery (Adamson et al. 2020), spine (Gornet et al. 2018; Malik et al. 2020), sports (Qin et al. 2019; Ferrari et al. 2017), and total joint arthroplasty (P. K. Edwards et al. 2019; Greenky et al. 2019; Courtney et al. 2018). Additionally, previous studies have demonstrated the economic benefits of outpatient orthopaedic surgery, with one study demonstrating direct cost savings between 17% and 43% for pediatric orthopaedic sports procedures performed at an ASC compared to those performed at a university-based children's hospital (Fabricant et al. 2016). Even within the same institution, Kadhim et al. found that the same surgeon could perform the same surgery in a significantly shorter amount of time and with improved operating room (OR) work efficiency at an ASC compared to an inpatient facility (Kadhim et al. 2016).

For orthopaedic surgeons, co-ownership of outpatient surgery centers can prove to be a lucrative and reliable investment. By co-owning their own surgery centers, surgeons can share in the profits from the facility fees in addition to their physician reimbursement. Additionally, they have more control over their operational workflow, so they can make adjustments that decrease variable costs, improve patient care, and increase practice revenue. Since the outpatient surgery center income is considered passive income, they can also offset this income from a tax standpoint by employing tax-advantaged investment strategies elsewhere, such as cost segregation studies and bonus depreciation, to generate paper losses. Of note, it is important to consult a licensed tax planning expert prior to employing complex tax strategies in order to get an in-depth evaluation of their personal situation. For private practice orthopaedic surgeons, co-ownership of outpatient surgery centers can be financially and professionally rewarding by increasing both earnings and control in their practice.

MEDICAL OFFICE BUILDINGS

Orthopaedic surgeons may have unique opportunities to invest in medical office buildings (MOBs). This often starts with surgeons buying the building in which they run their clinic. Since they are the primary tenant, this can be a very safe investment and quite lucrative in the long run. If the building is large enough, they may also have additional tenants. This can be especially beneficial if the other tenants create synergies with the orthopaedic practice, such as a PT practice or DME supplier. Over time, surgeons may choose to acquire more MOBs due to a growth in their orthopaedic practice or the acquisition of in-house ancillary services that result in the need for more space. Alternatively, some surgeons may also leverage their medical network to find off-market opportunities to purchase MOBs at discounted prices from retiring physicians or those moving to other geographies. Ultimately, since most MOBs have few tenants, it is important to conduct prudent due diligence prior to purchasing a new property. This includes evaluating the going market rent at similar properties, in-place leases, lease terms, financial well-being of the current lessees, and switching costs for the tenants to move to another building. Of note, MOBs have certain recession-resistant characteristics that allowed them to be a relatively resilient asset classes throughout the 2008 Great Financial Crisis and COVID-19 pandemic. This includes stable long-term occupancy rates and the overall strength of the healthcare as an essential industry. For private practice orthopaedic surgeons, medical office buildings can be a great way to build equity, diversify income streams, and generate tax-advantaged earnings.

OTHER REAL ESTATE ASSET CLASSES

Some orthopaedic surgeons with real estate expertise and interest may decide to expand their investment portfolio beyond medical real estate. This may include investing in single family rentals (SFRs), multifamily apartments, short-term rentals (STRs), self-storage units, mobile home parks, industrial warehouses, office buildings, and hospitality properties. These investments may be active or passive, i.e., they may be made directly or through limited partnerships with real estate private equity firms. Due to their high net worth and income, orthopaedic surgeons often qualify as accredited investors and may have access to investment opportunities that are not available to the lay investor. Accredited investor status is defined as 1) an individual with an annual gross income greater than or equal to $200,000, 2) a married couple with an annual gross income greater than or equal to $300,000, or 3) an individual or married couple with more than $1,000,000 in net investable assets.

While orthopaedic surgeons often meet these criteria, it is important to remember that this is not a direct area of expertise or an arena in which they have a competitive advantage over other high-net-worth (HNW) investors. Therefore, orthopaedic surgeons should seek out education from books, podcasts, blogs, and online courses prior to investing and exercise caution. Some educational books that could serve as a starting point include *Rich Dad Poor Dad*, *The Millionaire Real Estate Investor*, *The Hands-Off Investor*, *The ABCs of Real Estate Investing*, and *Investing in Private Equity Real Estate*. Some popular podcasts in this space include the Passive Wealth Strategies podcast, the White Coat Investor podcast, and the Doctors Investing Group podcast. While these investments can be very lucrative, they are inherently very illiquid and could result in complete loss. For orthopaedic surgeons interested in real estate who want to build generational wealth, tax-advantaged earnings, and passive cash flow, private real estate offerings can present a compelling value proposition.

MEDICAL DEVICE INVESTING

Given their deep subject matter expertise in orthopaedic surgery, musculoskeletal pathology, and the medical device industry, orthopaedic surgeons have a clear competitive advantage over lay investors within medical device and ortho-biologics. This may include angel investing in private companies or making large, concentrated bets on public companies. While no level of expertise guarantees success and all investments should be made with the utmost caution, company due diligence can help orthopaedic surgeons learn about up-and-coming technologies in the field and a prudent investment approach can create lucrative financial returns.

DUE DILIGENCE

For the orthopaedic surgeon investor, it is important to consider various factors prior to making an investment. This includes due diligence on the management team, the pain points being addressed, market size and opportunity, competitive landscape, company's differentiation, revenue, and valuation. Evaluation of the management team should, at minimum, include meeting in person or virtually, requesting professional references, conducting a holistic background check, and checking for relevant work experience. The management team is arguably the most important factor for companies, so surgeons should be meticulous in this aspect of due diligence. Additionally, surgeons should use their expertise to consider the pain points being addressed, size of the potential market, competitive landscape, and the company's differentiation. Market size analysis can be conducted by ascertaining the total addressable market (TAM), serviceable available market (SAM), and serviceable obtainable market (SOM). The TAM includes the entire market for a product, the SAM includes a portion of the TAM that is reachable based on the business model, and the SOM includes the portion of the SAM that is realistically obtainable based on the competitive landscape. Lastly, it is important to consider revenue and valuation. It is common for new medical device companies to have net losses as they continue to invest more capital into growing their business toward a scalable, profitable model. Therefore, valuation should be based on gross revenue, rather than profits. It may be appropriate to discuss revenue growth assumptions with the management team if there are any concerns or obvious inflection points. While various valuation models exist in the finance world, the simplest and most efficient way for orthopaedic surgeons to consider valuation is by searching for recent comparable company exits and the overall industry revenue multiple. This can be found on websites, such as Crunchbase, Pitchbook, or Simply Wall Street. By multiplying the company's revenue by various possible revenue multiples, surgeons can derive an estimate of the fair market value of a company. Similarly, the future projected revenue can be multiplied by revenue multiples to ascertain potential future valuations and returns.

PRIVATE MARKET INVESTING

Orthopaedic surgeons who are well-versed in investing and well-connected in the startup ecosystem may choose to participate in angel investing. Angel investing can allow surgeons to drive healthcare innovation by supporting impactful companies, stay up to date on the newest technologies, and create outsized returns in their own personal portfolios. Alternatively, orthopaedic surgeons may choose to invest a lump sum of money passively with a venture capital or private equity firm focused on investing in medical devices. However, by understanding the due diligence process, surgeons can better scrutinize portfolio companies of these firms and make better investment decisions. Ultimately, when investing in private companies, whether directly or through established firms, it is important to recognize that there are various risks, including potential loss of principal, lack of liquidity, and lack of transparency. Private market investing can provide innovative, financially-savvy orthopaedic surgeons with the ability to learn about upcoming technological innovations, direct healthcare in-

novation through impact-driven investments, and create long-lasting generational wealth.

PUBLIC MARKET INVESTING

Orthopaedic surgeons may also choose to make concentrated bets on publicly traded companies in the stock market outside of a typical broadly-based index or mutual fund portfolio. In the medical device industry, specifically, surgeons can use their orthopaedic knowledge to make more informed decisions on the potential success of certain products. For example, orthopaedic surgeons specializing in total joint arthroplasty are better equipped to understand the nuances between Stryker's MAKO robot and Zimmer Biomet's ROSA system. Additionally, surgeons may choose to evaluate the likelihood of success of smaller companies by reviewing research related to their pending 510(k) or premarket approval (PMA) approval decision. Interestingly, one previous study of healthcare-related mutual fund managers found that funds run by specialists, including medical doctors and scientific PhDs, perform significantly better than those run by non-physicians by 4.7% annually. After adjusting for risk and observable fund manager characteristics, this difference was even higher at 7.8% annually (Kostovetsky and Ratushny 2016). Overall, public market investing can have various advantages and disadvantages compared to private market investing. Unlike in the private market, public companies listed on the stock market are closely regulated and monitored by the U.S. Securities and Exchange Commission (SEC). Therefore, there is far more transparency, and their financials are examined with a higher level of scrutiny to protect investors. Additionally, given the large-scale nature of public companies, it is less likely that an investment would result in a complete loss. Lastly, the public market offers far more liquidity compared to the private market since investors can buy and sell shares almost instantaneously. While liquidity can be advantageous in that it allows for easy access to capital, it can also be very detrimental if regular trading results in unfavorable tax treatment or behavioral factors result in fire sales during market downturns.

CONCLUSION

Orthopaedic surgeons are inherently innovative, well-positioned for entrepreneurial success, and have numerous opportunities to utilize their expertise outside of their clinical practice. While this may include entrepreneurship, consulting, ancillary services management, real estate, and medical device investing, the only true limitations are time, energy, and creativity. In pursuing non-clinical opportunities outside of their clinical practice, orthopaedic surgeons should first identify their goals for doing so. While some may be driven by making broader impacts on healthcare, others may simply want to generate passive income streams, so they can reach financial independence sooner. Ultimately, it is important for the orthopaedic surgeon to consider if a new venture helps them achieve these goals, so they can attain greater satisfaction in their personal and professional lives.

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