The future of personalized care for vascular patients: an industry perspective

Nick E.J. West* and Els Boone

Abbott Vascular, Santa Clara, 3200 Lakeside Drive, Santa Clara, CA 95054, USA

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Healthcare has entered a brave new world in the early part of the 21st century: the landscape has changed and continues to change rapidly, evolving at a rate as never seen before. Fuelled by technological advancement, big data analytics, and the exploitation of apps and sensors, as well as by telemedicine and remote monitoring needs driven by the COVID-19 pandemic, the healthcare ecosystem is metamorphosing literally before our eyes. So, what is the role for the Medtech industry as healthcare systems reshape themselves to address emerging patients’ needs and desires, and how can the use of data and novel technologies be leveraged to bring about the kind of change needed to deliver truly holistic patient care?

Introduction

As patients become consumers and healthcare systems drive towards value-based care, what is the role for the Medtech industry? Despite enormous progress in the digitalization of healthcare records and enabling consults and device monitoring remotely, the patient care continuum remains fragmented and has been so worldwide for many years: intermittent ‘staccato’ contacts and an intervention-focused mindset often leave patients and their loved ones dissatisfied and uninformed, without a connected overview of diagnosis, therapies, and prognosis. For this persistent problem to be addressed, all stakeholders in the broader healthcare ecosystem must be prepared to work together to solve the impediments to optimal patient care, towards delivery of personalized healthcare and shared decision-making, and to enable early and accurate diagnosis via standardized processes and development of optimized treatment pathways to ensure that patient outcomes and experiences are maximized. Such transformation requires patient, physician, and administrator/healthcare leader engagement, alongside a pressing need for policy change and a switch away from ‘intervention-based’ reimbursement.

Patient centricity

The concept of placing the patient at the centre of everything is not a new idea for those accustomed to working as healthcare providers/caregivers, but perhaps does seem innovative for Medtech, which subtly re-adjusts focus: patients, not physicians or healthcare systems, are the end-recipient of delivered therapies and treatments, and as such, their unique customer voices must be considered (Figure 1). Although devices have been developed and iterated for many years listening to clinicians’ needs and suggestions, and efficiencies to drive cost improvements have met the requests of providers, patients have become no longer simply recipients of care. Whether we should even refer to people as patients per se remains moot: the word patient derives from the Latin word patiens, derived from the verb patior: ‘I suffer, endure or tolerate’—and whether such negative connotations should be applied to people when being cared for, especially when they are placed at the centre of our thinking, should be carefully considered.

*Corresponding author: Tel: +1 408 845 3190, Fax: +1 408 845 0849, Email: nick.west@abbott.com

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People/patients are increasingly viewed as consumers of healthcare—and as in other consumer and tech settings, their desires and needs must be addressed. Our survey clearly indicates that patients’ needs and desires are perhaps more advanced than we may have assumed: they desire more time spent with their physician, and for that physician to be as well informed as possible—often supported by experiences of others and outside data; they want to be engaged in shared decision-making, and to receive a tailored, personalized treatment pathway, taking into account their specific comorbidities, history, and data. Of course, such an approach should de facto drive improvements in both patient experience and outcomes, and with this in mind, qualitative measures including quality of life metrics become more relevant than ever. Although cardiovascular trials have traditionally focused on binary, pathologically defined endpoints such as death, myocardial infarction, stroke, and so on, some of these concepts matter little to patients unless they actually sustain the complication in question. Above all, many patients’ primary goal is an improvement in their symptoms and quality of life from any treatment or a planned procedure, and therefore patient-oriented outcomes are increasingly important. As reimbursement for patient care and procedures now often include payments related to quality metrics, as a part of the growing trend for value-based healthcare, the Medtech industry must take notice and include patient-facing measures in clinical trials and not perhaps focus solely on the hard endpoints designed to demonstrate safety and efficacy of products. There is already increasing awareness of this amongst clinical trialists, with the growing use of validated quality of life measures prospectively built into trial design, and ‘softer’ questionnaire-based endpoints (e.g. Seattle angina, EQ5D questionnaires), enabling reliable assessment of the type of benefits and experiences that may truly matter to patients themselves. However, this kind of approach mandates a subtle shift from the kind of hard clinical endpoints from studies that tend to drive guideline changes and thence routine clinical practice—and perhaps represents another area that must be embraced by all stakeholders in the entire care continuum in order to become an accepted reality (Figure 2).

How can the Medtech industry support the healthcare ecosystem?

Growing patient empowerment and a desire to share in medical decision-making are paralleled with the surge in interest in connected tools to help measure health:
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as the distinction between ‘true’ healthcare-initiated monitoring mechanisms and personally chosen digital wellness tools blurs, there is increasing need to be able to draw on all of these data sources and integrate/synthesize such outputs to develop a personalized view of individuals’ health and projected care. Such richness and granularity of gathered data provide unprecedented opportunities to generate predictive algorithms through big data analytic techniques such as machine learning, and this kind of service is a win–win–win for patients, healthcare providers, and the Medtech industry itself, as well as society at large through the promotion of health and healthy behaviours. Implicit in these developments is the concept that although the motivations of the different stakeholders for engaging in this process may be different, the intended end goals are shared: better health, achieved via personalized care.

Further, as we move away from a product-centric to a patient-centric mindset, the Medtech industry should consider the full patient journey, from diagnosis through treatment and longer-term follow-up, and this should and must develop into a prolongation (in patient disease trajectory/lifetime terms) of the responsibilities of companies in this space.

Engagement with novel technologies as enablers of patient centricity

Innovative and disruptive technologies can not only help to improve accuracy and timeliness of patient diagnosis (a pressing need outlined by our survey) but also be deployed to optimize treatments—for example, through artificial intelligence/machine learning-enabled therapeutic tools to augment physician knowledge/understanding. Additionally, customized applications and remote monitoring tools and techniques (including telemedicine) can also ensure more qualitative and accurate patient follow-up, even when patients are unable or unwilling to visit healthcare facilities. All of these tools can enable physicians to deliver more qualitative and patient-oriented discussions and treatment plans, as well as inform shared decision-making, which will further enhance the value proposition of personalized patient care and follow-up. This should, in turn, improve the patient experience and clinician satisfaction—and such improvements will extend beyond the patient themselves, to their family, and carers—key stakeholders as part of the patient journey that are often overlooked in terms of therapy/care delivery. The knock-on effect of such a strategy can also enable improved physician satisfaction, as they are able to provide a less generic and more specific approach to care, and support their patients beyond traditional hard clinical endpoints. This will also facilitate a more time- and cost-efficient healthcare model, satisfying administrators/healthcare leaders, and hospital systems in turn. However, as we embrace such disruptive technologies, care must be exercised to ensure that adoption itself does not disrupt pre-existing workflows—for example in the case of early electronic patient record data entry that manifestly interrupted the doctor–patient interaction and led to reduced satisfaction on both sides of the relationship.

It’s therefore clear that the Medtech industry is well equipped (or indeed can be well equipped) and well positioned to provide meaningful support to develop more personalized vascular care across the entire patient care continuum. Such an approach may require not only working more closely with physicians, hospital systems, and indeed patients but potentially with other industry partners in addition. An important caveat to this, however, is the siloed nature not only of healthcare systems, but of industry functions in addition—both need to be considered in order for the delivery to patients of the

Figure 2  Clinical vs. patient-oriented outcomes. Traditionally, the medical world has viewed patient outcomes for cardiovascular trials as binary: death, myocardial infarction, stroke, revascularization yes/no—and such persuasive data drive guideline uptake and acceptance into clinical practice. As the paradigm shifts towards patient-centric care and patient-oriented outcomes, more weight should be placed on patient-related and -driven goals and outcomes, as these may drive socio-economic concerns such as impact on Gross Domestic Product of early retirement for adversely affected individuals. Reimbursement occupies the hinterland between interventions and outcomes (current focus) and qualitative metrics (future state).
holistic care that they expect and require as 21st century consumers of healthcare—they do not see the ‘borders’ between different specialty services in hospitals, nor between primary care physicians and the specialists that they work with, and cannot have visibility to the different divisions within the industry that serve pathophysiologically discrete cardiovascular therapy areas such as coronary artery disease, arrhythmia management, heart failure care, structural heart disease implants, and so on notwithstanding wider gulfs between these areas and other industry functions such as pharmaceutical, endoscopic, pain management, diabetes care, and so on. If we, as an ecosystem, strive to provide truly joined-up and personalized care, such boundaries must, perforce, be either broken down or surmounted.

How can technology support a more personalized patient approach?

This question should perhaps be better phrased as ‘how can we incorporate non-traditional data sources into decision-making to support a more personalized patient approach?’ With exponentially increasing ownership of smartphones, smartwatches, and other consumer monitoring devices—of which around 320 million are estimated to ship to customers this year alone worldwide—the amount of data that could potentially be harnessed is enormous. Consumer surveys indicate that people are already using these devices to monitor themselves for general fitness and wellness reasons, as well as for cardiovascular health. And although a blunt tool in some ways, simple measures such as step counts could act as useful surrogates for exercise limitation in angina or heart failure sufferers, alongside heart rate sensors that have already evolved beyond simply counting beats and can now detect abnormalities of the heart rhythm such as atrial fibrillation with increasing granularity. In the wake of the COVID-19 pandemic, as the world likely faces a ‘coming tsunami of common, chronic disease’, digital health infrastructures designed to harness and incorporate these data sources alongside more traditional metrics could enable algorithmic and artificial intelligence-enhanced integrated analytics to power both personalized and population-based health-care programmes.

Beyond such simple metrics and their incorporation into electronic patient records, several examples of supportive technologies have been described within this supplement, including novel sensors for everyday routine clinical care and patient applications for use in quantifying day-to-day angina burden in clinical trials, as well as for remote delivery of essential services such as cardiac rehabilitation (an approach now being embraced by the UK’s National Health Service with an application for treating insomnia now available on prescription in preference to hypnotics, as a first step in a promise to digitize services in the coming years). Several of the technologies described include the critical element of patient involvement: treatment goals may, for the first time, incorporate what matters to the individual patients themselves rather than the traditional measures that the clinical community has relied upon. Such patient centricity in terms of outcome goals goes one step further to support benefits to all stakeholders in this journey, and at a preliminary stage, appears to appeal strongly to end users.

Conclusions

We stand on the threshold of a new era for healthcare: patients (or people) are now increasingly empowered as consumers and are demonstrably willing to engage with both active and passive measures to allow a level of involvement in decision-making, treatment planning, and follow-up/monitoring. All of the stakeholders in the healthcare ecosystem now have an obligation to enable such participation in patients’ journeys, by considering the unmet needs not only of hospitals and physicians (which are also important) but also of the patients themselves—the end-recipient of healthcare diagnostics and treatments. Innovation must therefore take these critical viewpoints into account whilst maintaining a socially conscious stance to avoid perpetuating inequities consequent on the social determinants of health such as socioeconomic status, and usher in truly unbiased and equal access to improved and personalized healthcare for all.

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