

The Institute of Medicine Report on the FDA 510(k) Device Clearance Process: Dead on Arrival or Foundation for a New Regulatory Framework?

In light of questions regarding the ability of the 510(k) process to protect patients, and complaints that the process has become too burdensome and time-consuming, the US Food and Drug Administration (FDA) commissioned the Institute of Medicine (IOM) to conduct an extensive evaluation of the 510(k) premarket notification process.¹ With the release of the IOM's report on July 29, 2011, entitled "Medical Devices and the Public's Health: The FDA 510(k) Clearance Process at 35 Years,"² controversy has ensued. Most of the device industry has condemned the IOM's conclusions and recommendations as suggesting unworkable, onerous, and unnecessary regulatory requirements that would deter innovation. Even FDA has already rejected one of the IOM report's central conclusions—the replacement of the 510(k) process entirely.³

Despite this reaction, it is likely the IOM report will be a reference point for critics of the 510(k) process during the upcoming reauthorization of medical device user fees, and amendments to implement all or part of the report will certainly be introduced. As a practical matter, the chances for the near-term implementation of the IOM's more expansive recommendations are quite low, and the 510(k) clearance process will likely remain in place for years to come. Many in Congress have little appetite for adopting new regulatory frameworks that can be characterized as retarding innovation and employment. Nonetheless, the IOM report's recommendations may provide greater impetus for the administrative changes to the 510(k) process currently underway at FDA, and perhaps incremental legislative changes. And, as has been the case with prior FDA-focused IOM

- 1 The IOM's report comes on the heels of FDA's internal assessment of its 510(k) process, which was published in 2010. See Arnold & Porter LLP, "Advisory: FDA Begins Overhaul of the 510(k) Process," (August 2010) available at: http://www.arnoldporter.com/public_document.cfm?id=16405&key=4F1.
- 2 The report is available for the National Academies Press at: http://www.nap.edu/catalog.php?record_id=13150.
Note: William Vodra served on the IOM Panel. Prior to this appointment, he had retired from the active practice of law as a partner at Arnold & Porter LLP. He did not participate in preparation of this Advisory.
- 3 <http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm265908.htm>.

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reports on topics ranging from drug safety to pesticides in food, over time the IOM Report will be a factor in future debates over medical device regulatory reforms.

FDA asked IOM to answer two questions:

- 1) Does the current 510(k) clearance process optimally protect patients and promote innovation in support of public health?
- 2) If not, what legislative, regulatory, or administrative changes are recommended to achieve optimally the goals of the 510(k) clearance process?

To answer these questions, IOM examined the legislative history and evolution of the 510(k) process; FDA's implementation of the 510(k) process; data on the post-market safety and effectiveness for 510(k)-cleared devices; how the 510(k) process fits into the larger medical device regulatory framework; and other factors that affect the development of medical devices, such as the process of innovating and commercializing medical devices and the impact of health IT, software, and other new technologies. The committee also hosted public workshops in June and July 2010 to solicit comments on the 510(k) process and other issues that impact the regulation of medical devices.

Conclusions

After extensive review of these factors, IOM reached two main conclusions that have spurred significant discussion and debate among regulators, industry, and other stakeholders.

- 1) The 510(k) clearance process generally is not intended to evaluate the safety and effectiveness of medical devices because the standard for clearance is substantial equivalence to any previously cleared device.**

The IOM concluded that in determining substantial equivalence during the 510(k) process, FDA generally does not assess safety and effectiveness. A finding of substantial equivalence only means that FDA has found that the new device is safe and effective relative to the predicate device. Moreover, the many predicate devices on the market before the enactment of the 1976

Medical Device Amendments (MDA) have never been systematically evaluated for safety and effectiveness.

According to the IOM report, the Safe Medical Device Amendments (SMDA) of 1990 allowed FDA “to require evidence of safety and effectiveness, including clinical studies, when necessary to determine whether a difference in technologic characteristics between a new device and its predicate renders the new device less safe or effective than the predicate or raises different questions of safety and effectiveness from the predicate.” Under this framework, if FDA finds that a device with new technologic characteristics is still as safe and effective as the predicate, despite the technological changes or additional evidence of safety and effectiveness, then FDA could issue a finding of substantial equivalence. The IOM concluded that, in practice, FDA finds that almost all 510(k) applications with new technologic characteristics are substantially equivalent to a predicate.

In reviewing post-market data on device performance, however, the IOM found that there was insufficient information to make meaningful conclusions about the safety and effectiveness of 510(k)-cleared devices. IOM made a point of stating that it “does not believe... that there is a public-health crisis related to unsafe or ineffective medical devices.” Despite having no formal review of the safety and effectiveness of Class II devices on the market before the 1976 MDA, the IOM found that “their continued use in clinical practice provides at least a level of confidence in their safety and effectiveness.”

- 2) Information that would allow an understanding of the extent to which the 510(k) clearance process either facilitates or inhibits innovation does not exist.**

The IOM found that technological innovation generally is beneficially in the context of public health, but concluded the 510(k) process was not designed to reward, recognize, or encourage innovation and is not the appropriate mechanism to do so. According to the IOM, one of the underlying goals of the “substantial

equivalence” standard is to provide a faster route to market for devices that do not raise new or different safety or effectiveness questions. It noted that in establishing this standard, Congress recognized that some innovative developments and product improvements could be addressed effectively through the less burdensome 510(k) process. However, the statute, on its face, does not require manufacturers to evolve their technologies with the state-of-the-art; it merely requires them to show that their devices are not inferior to its predicate(s) in terms of safety or effectiveness.

According to the IOM, FDA has adopted a liberal interpretation of substantial equivalence that, in some cases, has resulted in the 510(k) process being used as a pathway to avoid requiring pre-market approval applications (PMAs) for novel devices that would be more appropriately reviewed under the PMA pathway. As a result of this approach, many new devices which might be superior to their predicates in many respects are deemed to be substantially equivalent. Once that decision is made, the precedent has been established and the new devices cannot be removed from the pool of available predicates for subsequent devices. The IOM suggests that while the larger pool of predicates and the availability of multiple predicates encourage innovation, the larger impact on safety and effectiveness might not fully be appreciated or understood.

Accordingly, the IOM concludes that “innovativeness” should not be a criterion for device clearance decisions. Although the IOM recognizes the benefits of innovation, which it defines as “improving the quality of, efficiency of, or access to healthcare,” it does not believe that FDA should be the arbiter or driver of innovation. Moreover, it believes that the agency should not use the device approval process to drive innovation or public health priorities because the process is not designed to do this. IOM further believes that FDA’s role should be to set approval requirements sufficient to ensure safety and effectiveness, yet pragmatic enough to allow timely entry of new innovative devices.

To that end, the IOM recommended that FDA commission an assessment to determine the effect of its regulatory process for Class II devices on facilitating innovation in the medical device industry. Based on its review of the legislative history and implementation of the 510(k) process and other studies, IOM concludes that it is impossible to determine whether changes to the 510(k) process over the last 35 years have had a positive or negative effect on innovation. As discussed below, this broad recommendation may have important implications for software developers, health IT, and telemedicine in that the IOM encouraged FDA to focus additional resources on analyzing and understanding potential effects of software on device safety and effectiveness.

Recommendations

IOM does not believe that further investment in the 510(k) process is the best use of FDA’s scarce resources because the 510(k) process does not meaningfully evaluate the safety and effectiveness of devices. Accordingly, IOM does not recommend changes to the 510(k) process itself but rather recommends that FDA should develop a new regulatory framework for medical device approval.

- **According to IOM, FDA should gather enough information to replace the current 510(k) substantial equivalence standard with a standard that provides reasonable assurance of safety and effectiveness.**

IOM believes that FDA does not currently have enough information to develop a new regulatory framework based on sound science. Although IOM says that it is beyond the scope of the report to detail the types of evidence necessary to prove a reasonable assurance of safety and effectiveness, it highlights the following areas for consideration:

- Performance of comparative devices
- Quality-system regulations, including design controls and product-release criteria
- Device labeling and a system of tracking labeling changes

- Comprehensive review of FDA device regulation over the last 35 years
- Consideration of foreign device regulatory systems

IOM further sets forth attributes of the ideal framework:

- The process should be based on sound science.
- The process should be clear, predictable, straightforward, and fair.
- The process should be self-sustaining and self-improving.
- The process should facilitate innovation that improves public health by making medical devices available in a timely manner and ensuring their safety and effectiveness throughout their lifecycle.
- The process should apply relevant and appropriate regulatory authorities and standards throughout the life cycle to ensure safety and effectiveness.
- The process should be risk-based.

- **FDA should develop and implement a comprehensive strategy to collect, analyze, and act on medical device post-market performance information.**

The process should include rigorous post-marketing surveillance that collects useful data such that meaningful conclusions can be made regarding a device's safety and effectiveness. More specifically, IOM recommends that FDA develop a post-marketing surveillance strategy to meet the following objectives:

- Providing performance information for use in the premarket review process
- Informing the development and use of postmarketing tools to manage the risk-benefit ratio throughout the life cycle of devices better
- Informing the design of a new regulatory framework

- **FDA should review its post-market regulatory authorities for medical devices to identify existing limitations on their use and to determine how the limitations can be addressed.**

FDA should identify barriers to the use of its post-market authorities and ways to mitigate them. Congress should pass legislation to remove barriers if necessary.

- **FDA should develop and implement a program of continuous quality improvement to track regulatory decisions on medical devices, identify potential process improvements in the medical device regulatory framework, and address emerging issues that affect decision making.**

IOM found that insufficient information technology prevents FDA from having the ability to track the history of 510(k) decisions. This makes it difficult for FDA to remove problematic predicate devices because it has no systematic way to identify them. And until FDA removes a problematic predicate device, new 510(k) submissions may continue to rely on the problematic predicate for the purposes of gaining clearance through substantial equivalence.

- **FDA should commission an assessment to determine the effect of its device regulatory process on facilitating or inhibiting innovation in the medical device industry.**

The study should go beyond measuring innovation by “time to market” or the number of devices of a particular type that are on the market, and instead focus on life-cycle management issues. Specifically, the IOM recommended that FDA focus on understanding how devices fit into the larger societal and public health framework by analyzing issues such as:

- The relationship among innovation, regulation, and patient health throughout the device lifecycle; and
- The impact of incremental changes in existing devices on clinical use, safety, effectiveness, and research and development costs and economic factors such as government resources, coverage and reimbursement, and market exclusivity.

- **FDA should develop procedures that ensure the safety and effectiveness of software used in devices, software used as devices, and software used as a tool in producing devices.**

FDA must require evidence-based procedures to demonstrate the safety and effectiveness of software as software increasingly becomes integrated with medical devices. This integration has the potential to increase the uncertainty of device safety and cause unsafe interactions with other software systems. The IOM stated that “[r]eliance on ‘best practices’ is no longer sufficient, particularly when best-practice recommendations often lag behind rapid change in software innovation.”⁴ Specifically, the committee recommended that FDA update its guidance on software validation because the increased use of software and rapid innovation contributes to uncertainty regarding device safety, reliability, and security.

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Certain of these recommendations are innocuous. For example, it would be helpful to policy making to improve the understanding of measures that facilitate or inhibit device innovation—as long as the assessment is well-designed and considers an appropriate range of factors. In contrast, it is not clear that device software requires higher regulatory standards *per se*: FDA has been focused on software regulation for years, has acknowledged many of the issues noted by the IOM, and has ample authority in the area. However, the IOM’s broader conclusion that the 510(k) process is not intended to evaluate the safety and effectiveness of medical devices and should be abandoned, while dramatic, may be less helpful than more granular recommendations on the optimization of the 510(k) program under current—or at most incrementally improved—processes and standards. While some concerns about the 510(k) process are quite valid and deserve serious attention, there is no public health crisis involving 510(k)-cleared devices, as the IOM acknowledges.

⁴ IOM Report at p. 164.

Given the strong public interest in FDA’s comprehensive evaluation of the 510(k) process, FDA is soliciting public comments on IOM’s report. 76 Fed. Reg. 45,825 (Aug. 1, 2011). Comments are due by September 30, 2011, and the docket number is FDA–2011–N–0556.

If you have any questions about any of the topics discussed in this advisory, please contact your Arnold & Porter attorney or any of the following attorneys:

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