8 Herbert Street, St Leonards NSW 2065
PO Box 970, Artarmon NSW 1570, Australia
Ph: 61 2 9467 1000 Fax: 61 2 9467 1010

stryker®

South Pacific

6 October 2011

Senate Standing Committees on Community Affairs
PO Box 6100
Parliament House
Canberra ACT 2600
Australia

Re: Inquiry into the Regulatory Standards for the Approval of Medical Devices

Dear Committee Secretary,

I am writing to you in relation to the Senate Committee Affairs References Committee's Inquiry into the Regulatory Standards for the Approval of Medical Devices. As you may be aware, Stryker, an international medical technology company with expertise in remanufacturing, provided a submission to the Inquiry which addressed term of reference (e) *the safety standards and approval process for devices that are remanufactured for multiple use.*

Since providing our initial submission to the Committee, Stryker has had the opportunity to review the other submissions to the Committee and become aware that a number of these contain some fundamental misunderstandings about the remanufacturing of devices and some serious factual errors. Stryker requested an opportunity to provide additional evidence to address these issues at the public hearing on the 27th of September however, we were unable to present as there was no room available on the schedule. Stryker representatives attended the hearing and we noted that remanufacturing issues were not discussed to any significant extent on that occasion. As a result, we feel that Committee members have not had the opportunity to form an accurate view of remanufacturing issues and their relevant approval and regulatory processes.

To this end, Stryker has prepared the enclosed document which addresses the issues raised about remanufacturing in the submissions and explains the key concepts involved in the complex remanufacturing process. This document also clarifies some areas of confusion arising in the submissions around the difference between a validated remanufacturing process, as undertaken by Stryker, and other practices of re-using medical devices. We have also provided copies of this document to the Committee members and hope that it will prove useful in the preparation of the report and associated recommendations.

Stryker has substantial additional material on remanufacturing processes which we can provide to the Committee Secretariat on request. Please do not hesitate to contact me if you have any questions or would like any further information on Stryker or our remanufacturing processes.

Yours sincerely,

Chris Szeleczky
National Business Manager
Stryker Sustainability Solutions

Re-manufacturing medical devices – clarification and definitions

Introduction

Stryker welcomes the inclusion of remanufacturing of medical devices labeled and marketed as 'single-use' in the terms of reference for the Senate Standing Committee on Community Affairs' Inquiry into the regulation of medical devices. Stryker believes that controlled and scientifically supported remanufacturing can play an important role in developing a safe and financially sustainable health system for Australia's future. We look forward to working with Government and other stakeholders to develop an appropriate policy and regulatory environment which delivers maximum benefits of remanufacturing to the Australian community.

In reviewing the many Submissions to the Inquiry, it is clear that a fundamental misunderstanding of the remanufacturing process as well as confusion between a validated remanufacturing process and other practices involving the reuse of devices exists. The fundamental concern for any medical device used, regardless of how a device is labeled: 'reusable' or 'single-use,' is that it must be safe for its intended use. In many cases the labeling of the original device is arbitrary, at the sole discretion of the manufacturer and is less important than the process involved with preparing that device for use. Therefore, we would like to take this opportunity to outline some key concepts involved with validated remanufacturing, define some key concepts and clarify some of the issues raised in submissions on remanufacturing processes.

Clarification of the issues

The following section outlines the key concepts and definitional issues crucial to an understanding of validated remanufacturing, as practiced by Stryker.

What is validated remanufacturing?

The validated remanufacturing of medical devices is a complex and rigorous process designed to prepare medical devices for subsequent use; and in many ways is far more involved than any process currently in place in Australian hospitals for preparing reusable devices labeled for clinical use. Remanufacturing processes are evidence-based and validated through rigorous, scientifically defensible studies and internationally recognized standards. Developing processes for the remanufacturing of medical devices requires careful selection of candidate devices, thorough analysis of data gathered during reverse engineering, the use of specialized, and in some cases customized technologies to assure that remanufactured single-use devices are as safe and effective as original devices.

Each device has a specifically designed process, however, a general guide to the steps involved in remanufacturing is as follows:

1. Controlled collection process
2. Gross decontamination
3. Serial tacking
4. Disassembly (for appropriate devices)
5. Validated cleaning
6. Reassembly
7. Functional processing & verification
8. Final re-cleaning
9. Packaging & labeling
10. Validated terminal sterilization

In some cases devices with multiple components are completely disassembled to their base components. Each component itself is then cleaned, tested and inspected and finished devices are then reassembled from only components that have passed individual quality inspections.

This process is applied each time a device is returned for remanufacturing after each and every use. While regulatory and design control issues determine the number of cycles each device is able to undergo, the way in which the device is used, collected and transported can have an impact on the life-cycle of a device. This means that health care providers and consumers can be sure that any device used in delivering health care has been appropriately remanufactured and that the device cycle is well within evidence-based parameters. This is not understood by critics of remanufacturing who sometimes falsely claim that remanufactured devices are being used for an unlimited number of times and without any regulation.

Validated remanufacturing appropriately falls under the jurisdiction of the Therapeutic Goods Administration (TGA) in Australia. This regulatory body is responsible for independently verifying that remanufacturing processes undertaken by a remanufacturer ensures the devices meet the same quality and safety standards as the originals.

Remanufacturing, as described above, differs markedly from the re-processing and re-use practices that occur in the hospital setting and by un-regulated third parties. These practices are common in some health systems, such as some parts of Europe, and do not result in the same safety and quality standards as those delivered by Stryker's methodology. In the context of a regulatory environment, Stryker only supports a rigorous remanufacturing process that is just as rigorous as the standards applied to original devices. That is, Stryker supports the regulatory framework of the TGA for remanufactured devices which enforces the same standards for devices, whether remanufactured or not. Many of the examples put forward as evidence for the risks of remanufacturing are in fact

examples of un-validated re-processing which are completely different from the remanufacturing services provided by Stryker.

How does remanufacturing of devices differ from re-using devices?

Remanufacturing devices using a validated remanufacturing process should not be confused with any other practice of reusing devices. There are many health care settings in which devices are reused without undergoing a validated remanufacturing process, for example a hospital may decide to clean and reuse devices without any external validation. This was common in Australian hospitals before being banned in 2003/04 and is still reportedly common in hospitals in some parts of the world. This ban stopped risky reuse practices but led to hospitals discarding many devices that could – with appropriate and validated remanufacturing – be used safely more than once.

Much of the literature which describes problems with using devices more than once refers to the re-use of devices without undergoing the rigorous process described above. Stryker does not support these practices and they should not be confused with the validated remanufacturing undertaken by Stryker and SterilMed, the company Johnson & Johnson recently announced it is to acquire.

Why are these devices labeled 'single use' if they can be used more than once?

Most 'single-use' devices cannot be re-used, however many devices which are labeled 'single-use' can be safely used more than once, under specific circumstances. The 'single-use' label is often misleading as it creates the false impression that the device must have been designed for single use only and that therefore using it more than once must be unsafe. The 'single use' label is in many instances arbitrarily applied by manufacturers to speed approval of their devices, limit liability or control the use of their products. In most cases it is not based on data demonstrating that a device cannot be reused given proper remanufacturing. Many devices labelled 'single use' are, in reality, 'limited use' and are similar to many other hospital products that are used on multiple patients, such as operating theatre instruments.

With the use of the 'single-use' label determined by the manufacturer, not by Government or a regulatory agency, original manufacturers stand to substantially increase their own revenue and profits. Labeling a device 'single use' also limits the amount of required validation data manufacturers submit to regulatory authorities as they can simply stop validating their products after one use. Consequently there is often an incentive for an original manufacturer to label a device 'single use'. The end result of this practice is however that hospitals (and therefore the Australian community) spend more than necessary purchasing medical devices and generating significant amounts of preventable medical waste.

Validated remanufacturing has been supported by the U.S. Government Accountability Office (GAO), an independent investigative body of the U.S. Congress which thoroughly researched the safety of remanufactured devices in 2008 and found that:

- All evidence suggests that properly remanufactured devices are as safe an effective as original devices.

- "The decision to label a device as single-use rests with the manufacturer. …a device may be labeled single-use because the manufacturer…..chooses not to conduct the studies needed to demonstrate that the device can be labeled reusable."[1]
- The fact that remanufactured devices must meet the same safety, quality, engineering and performance standards as original devices ensures that remanufactured devices are equivalent to original devices.

Regulation of remanufactured devices

A remanufactured device is required to comply with the same medical device regulations as the original device. In Australia, remanufactured devices must undergo an additional regulatory review process completely separate from that undertaken prior to the original device's initial introduction on the market. The remanufacturer becomes the manufacturer in the eyes of the TGA and becomes ultimately responsible for meeting all the safety and quality standards and assumes legal liability for the remanufactured products. Therefore, remanufacturers have the same responsibility and incentive as original manufacturers to ensure their products are safe and perform to the expected standards. Stryker supports this regulatory framework.

Are remanufactured devices safe?

The safety record for medical devices remanufactured according to the validated and scientifically based processes as outlined above is outstanding. Comprehensive evidence from the USA supports the safety and quality of remanufactured devices and has identified no additional problems associated with validated remanufacturing processes over and above those recognized by the original manufacturer. The overwhelming majority of reports to the Food and Drug Administration (FDA) of adverse events associated with medical devices relate to the first use of 'single use' devices and the FDA has stated that it has not identified 'any adverse events that were actually related to the reprocessing of the SUD (single use device).'

Furthermore, FDA's adverse event database contains over 6,500 reports of patient deaths associated with original (un-reprocessed) medical devices since 2004. According to the same database, no deaths have been associated with the use of reprocessed 'single use' medical devices.

Remanufactured devices are playing an increasingly important role in the development of safe, high quality and sustainable health systems internationally. A recent study showed that remanufactured devices are used in least 87 percent of America's top hospitals and are supported by a large number of reputable medical organisations, including:

- American Association of Orthopaedic Surgeons
- American Gastroenterological Association
- Association of Professionals in Infection Control and Epidemiology
- American Hospital Association

[1] Reprocessed single use medical devices: FDA oversight has increased and available information does not indicate that use presents an elevated health risk. GAO-08-147, US Government Accountability Office, January 2008

The remanufacturing of devices is also common in several Canadian States, Israel and many industrialised Asian countries. Currently, the European Union does not have a declaration regarding reprocessing of medical devices, however, it is in the process of revising its Medical Device Directive. Until that is revised, regulation of reprocessing activities is left to the individual Member States. A number of European countries have approved the use of remanufactured devices, including Germany, Denmark and Sweden.

Since 2001, Germany has had in place a regulatory framework that does not distinguish between the remanufacturing of 'reusable' and so-called 'single-use' medical devices. The guidelines, therefore, allow for the remanufacture of medical devices if conformance with certain standards is achieved.

Is there any evidence that remanufactured devices are not safe?

Stryker is aware of a number of examples of alleged problems with re-used devices described in submissions to the Inquiry. For example, the case studies provided on pages 17 of the Attachment to the Johnson & Johnson submission. Stryker supports the concern of Johnson & Johnson that the devices pictured and described are not safe and should not be used on patients. However, we cannot find any evidence that these devices have undergone a validated remanufacturing process. It is much more likely that they are examples of hospital-based or un-regulated third party re-processing which is not supported by Stryker and would not meet TGA regulations.

Stryker has a robust database of evidence supporting the high quality of devices it remanufactures. Collected during the past 24 years of operation, its database includes processing information on millions of devices it has safely remanufactured and a comprehensive complaints database as part of its ongoing post-market surveillance activities required by the U.S. FDA. This data provides evidence of the high level of safety of Stryker's remanufactured devices. For example, in 2010 Stryker produced approximately 175 000 reprocessed EP Catheters and received a complaint rate of less than 0.15%. This is considered very low by industry standards (complaint rates of ten times this amount are considered acceptable for new devices) and is due in part to the extensive testing conducted during the remanufacturing process and also to the fact that devices with flaws are generally identified during their first use (and therefore not accepted for remanufactured by Stryker).

This is also supported by an article in the Journal of Medical Device Regulation which stated that *'In the USA where SUD (single-use device) reprocessing is federally regulated, independent sources have also noted the absence of any evidence, from any source, indicating an increased risk to patient safety from the reprocessing of SUDs'*[2]

[2] Journal of Medical Device Regulation May 2011

Why is remanufacturing important?

Stryker believes that safety and quality are the most important principles of health care which should never be sacrificed in order to reduce costs. We are committed to supporting hospitals to provide high quality care, while using resources responsibly. Remanufacturing is one way in which hospitals can reduce the amount of resources they use without reducing the quality and safety of care provided. This creates opportunities for hospitals to provide additional services and ensures that our limited health care resources can be used to deliver maximum benefits to the Australian community. In this way, remanufacturing has an important role in contributing to the long-term sustainability of the Australian health system

Since its inception in the U.S. remanufacturing by Stryker alone has saved the U.S. healthcare system over one billion dollars. As healthcare systems around the world continue to seek ways to provide more care for aging populations, remanufacturing has emerged as the single most important strategy for hospitals to undertake to help reduce the pressure of rising supply costs.

Second, and no less important, remanufacturing significantly reduces the amount of unnecessary waste generated by healthcare. In the U.S., healthcare is second only to the food service industry in the amount of waste it generates. Remanufacturing eliminates hundreds of thousands of tons annually for landfills in the U.S. and it can do the same for Australia.

Addressing specific arguments

In this section Stryker would like to address specific arguments raised in submissions to the Inquiry about the re-use and remanufacture of devices.

'The new materials and technological advancements allow devices to become more intricate and not suitable for remanufacturing a 'single use device' is not designed to withstand the physical rigors of disassembly, sterilisation and remanufacture.'[3]

Stryker agrees that many devices are not suitable for remanufacturing due to any number of reasons, such as material composition, design limitations or original manufacturing processes. These devices are identified during our initial engineering assessments and are not remanufactured by Stryker. Stryker's rigorous pre-market testing and validation processes assess for safety and quality and further the TGA looks closely at whether or not the make-up of the original device qualifies it as suitable for remanufacturing.

As described above, Stryker remanufactures each device for a limited number of cycles. As part of each cycle, the device is subject to a complete engineering validation, which is more comprehensive than it undergoes after its original manufacture. This ensures that the device has not been damaged in any way during its use, collection or remanufacturing processes and can perform at the same level as an original device. These engineering tests are so rigorous that they often detect problems inherent with the original device itself and which were not detected by the original manufacturer. This has resulted in regulatory actions for the original manufacturer's which improved the safety of devices for consumers.

[3] Johnson and Johnson submission, Attachment page 5

'The third party reprocessors do not have full details of the device design.... which can create substantial technical challenges and affect compliance with critical regulatory safeguards, including materials safety and assessment of risk'[4]

There is a range of complexity with devices which affects the relevance of this point to remanufacturing. In cases where the lack of access to the original device specifications will affect the safety or quality of the remanufactured device Stryker does not remanufacture those products. However, in cases where no or limited data on a device exists, Stryker reconstructs the device design through an extensive re-engineering processes during the pre-market assessment. It is also important to note that if there are any problems with the safety, quality or performance of a remanufactured device these would be identified in the engineering validation process, but also through TGA, FDA and other regulatory agency databases.

As part of the regulatory requirements to register a re-manufactured device with the TGA, a key focus is meeting the requirements of the Essential Principles[5] including the engineering testing specifications. This ensures that the device is able to be safely remanufactured by Stryker.

'The reprocessing of single use devices by third-party businesses is a new and developing industry that has only been researched to a limited extent'[6]

Regulated and validated remanufacturing has occurred for over a decade in the USA. There is a considerable body of evidence that supports the safety of this process. As discussed above, FDA's adverse event database has failed to identify any safety problems relating to remanufacturing.

As with all medical devices, Stryker supports ongoing comprehensive post-market surveillance processes to identify any problems with devices once approved for use in the community.

'...the European Commission has accepted a formal opinion from its independent scientific advisory body, the Scientific Committee on Emerging and Newly Identified Health Risk, that the practice is unsafe.'[7]

The advisory body identified a number of risks associated with un-validated re-processing practices. This is because it is a common practice in many European countries. The group was not commenting specifically on validated third party remanufacturing and had not considered any detailed analyses of validated third party remanufacturing, such as that undertaken by Stryker. Stryker supports the conclusions of this group that re-processing when undertaken in an un-validated environment poses some risks, however this should not affect the acceptance of a safe and independently validated remanufactured process.

'...the residual contamination of third-party reprocessed single use devices and the risk that introduces in regard to potential cross infection.'[8]

[4] Johnson and Johnson submission, Attachment page 33
[5] Schedule 1 Therapeutic Goods (Medical Devices) Regulations 2002
[6] Johnson and Johnson submission, Attachment page 6
[7] Johnson and Johnson submission, Attachment page 34
[8] Johnson and Johnson submission, Attachment page 35

Stryker notes that contamination of devices with biological or other materials is a serious issue. However, it is not a problem confined to remanufactured devices as many single-use devices are found to be contaminated with biological materials when tested.

Stryker has undertaken rigorous research into this area internally and through third parties and has found substantial evidence to support the safety of remanufacturing, when conducted by a validated remanufacturer. Comprehensive biocompatibility and residual testing is part of validation testing. This may not occur with un-validated testing processes. Material analysis is also a key element during the validation process, materials must withstand the remanufacturing process in order to even be considered for reprocessing.

Stryker is committed to ensuring that high quality research informs the future manufacturing and remanufacturing of devices and will continue to actively monitor developments in research in this area.

Stryker has reviewed a number of the references provided in submissions (where available) and does not believe that these provide evidence to support the conclusion that a *controlled, evidence-based and validated* remanufacturing process poses any additional risk to consumers. For example,

- Luijit et al[9], appears to be studying the outcomes of a hospital-based reprocessing practice which differs substantially from the remanufacturing undertaken by Stryker.

- Chant et al[10] describes the case of a number of surgical patients in Sydney who had contracted Hepatitis C after sharing an operating theatre on a single session. The study does not address the use of remanufactured devices but investigates a number of possibilities for the cross-infection, including the accidental re-use of syringes and infection of surgical and anaesthetic equipment. The investigations found that 'Available evidence has led to a hypothesis that hepatitis C virus was transmitted through contamination of anaesthetic circuitry. The NSW Infection Control Policy for HIV, AIDS and associated conditions, published in 1992, states that 'A filter for the anaesthetic circuit must be used to prevent cross-infection of the anaesthetic circuit.'

- The Medtronic study[11]describes tests the company itself undertook on reprocessed equipment. It does not describe the specific processes involved or whether they complied with validated remanufacturing principles. Stryker has urged Medtronic to provide the details of these findings to the US regulator to ensure that they can be addressed. To date, Medtronic has not undertaken to do this.

Another concern is the build-up of abnormal proteins associated with prion diseases such as Creutzfeldt-Jacob Disease (CJD) and the variant Creutzfeldt-Jacob Disease (vCJD).[12]

[9] Johnson and Johnson Attachment footnote 29
[10] Johnson and Johnson Attachment footnote 33
[11] Medtronic Submission page 9
[1212] Johnson and Johnson Attachment page 7

Stryker understands the seriousness of Prion diseases and, in doing so, as a minimum meets all international and Australian standards for sterilisation, and undertakes all possible processes to reduce the risk of transmission of these rare diseases. Stryker remanufacturing implements processes that are arguably more stringent than any standard or accepted practice for sterilising reusable equipment in hospitals. This means that the risk of transmission of a Prion disease via a remanufactured device, while not zero, is lower than that of many other pieces of equipment commonly used in the medical setting.

To further reduce the risk of any Prion disease contamination, Stryker does not remanufacture any devices which have come into contact with the central nervous system, including brain and spine, and therefore may potentially have come into contact with Prion diseases. In addition, no devices used in the treatment of someone with a suspected Prion disease are accepted by Stryker for remanufacture.

Stryker notes that there have been no recorded instances of Prion transmission via remanufactured devices but will continue to monitor the research in this area and ensure that any relevant new findings are addressed in its remanufacturing process.

'...it may not be possible to identify where reprocessed products have been supplied and thus to notify users.'[13]

A number of the submissions raised the issue of tracking devices, in the event of problems[14]. Stryker has rigorous and audited tracking systems, where every device is given a unique serial number which tracks its lifecycle through the remanufacturing process. These serial numbers are logged and kept with the product and in the master "Device History Record", or DHR, at all times. This ensures that each device is only remanufactured up to its validated number of cycles and manages the traceability of the each device used in providing patient care (for post-market surveillance purposes). In accordance with U.S. regulation, the remanufacturer's name must be prominently displayed on the device and packaged in a way that also clearly identifies the remanufacturer. With this clinicians can readily identify the original manufacturer and model of the device and know how to use it. This enables recalls by original manufacturers to be easily managed and all affected devices identified by their model number and removed.

Remanufacturers are required to keep the same records, by device, and report the same information about any problems experienced as does the original manufacturer. Remanufacturers are also required to inform the original manufacturer or regulator when they detect a flaw with the design or manufacture of a device. In the USA, Ascent has been responsible for a number of product recalls through identifying flaws during the remanufacturing process and alerting the original manufacturers of these problems.

Stryker believes that remanufacturing provides regulatory agencies with greater insight into the performance of devices through collecting performance data every time a device is sequenced through the remanufacturing process.

Post-market surveillance issues

[13] Medtronic Submission page 9
[14] Johnson and Johnson, Medtronic Submissions

Stryker supports a robust post-market surveillance process for all medical devices. This is an important component of the regulation of all devices to ensure that any problems not identified during pre-market assessment processes are addressed. As described above, Stryker's tracking processes ensure that any remanufactured device found to be experiencing problems can be easily recalled.

Stryker notes that in the USA post-market surveillance data has shown that remanufactured devices have an impressive safety record and has not detected any adverse events associated with the remanufacturing process.

Recommendations

Stryker recommends:

- That the TGA (or appropriate body) conduct an inquiry into the un-validated reprocessing of medical devices in Australian hospitals and health care settings;
- That the TGA continues to apply the current regulatory framework to ensure that remanufactured devices are appropriately registered as medical devices and meet the same standards as other medical devices;
- That the TGA strengthen post-market surveillance processes for all medical devices to ensure that any problems developing once devices are on the market are identified and addressed as quickly as possible; and
- TGA apply the same standards to all devices, regardless of label, as related to the reuse of the device.