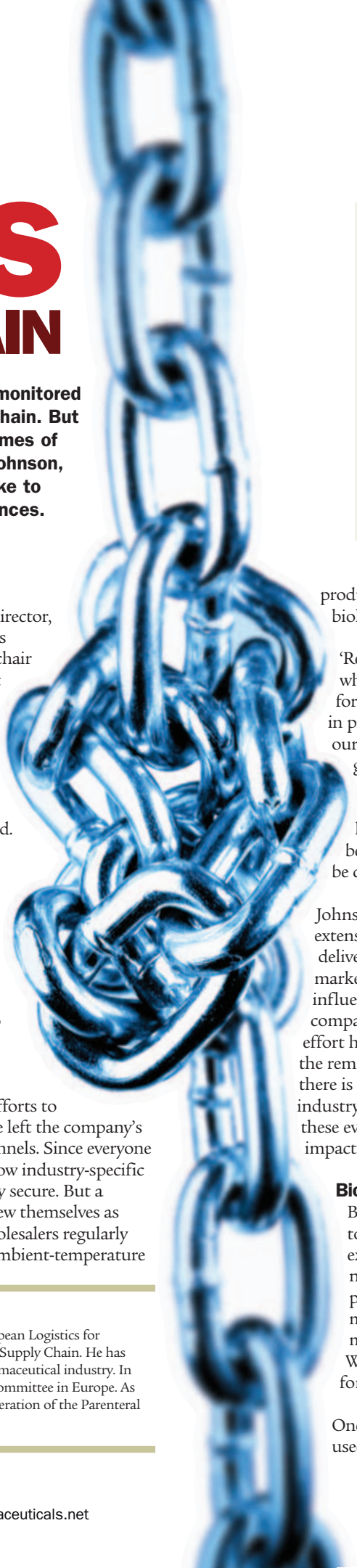
KINKS IN THE CHAIN

Cold chain management is closely monitored to control every link in the supply chain. But this is not always possible during times of crisis. Hugo Wegewijs, Johnson & Johnson, discusses the steps pharma can take to prepare for extraordinary circumstances.



End-to-end supply chain integrity is something Hugo Wegewijs, senior director, European Logistics, Global Biologics Supply Chain at Johnson & Johnson and chair of the Pharmaceutical Cold Chain Interest Group's European Branch, takes seriously. Having designed and implemented a comprehensive approach to cold chain management for Johnson & Johnson, he believes that although many areas of pharma distribution can be improved, situations remain that can never be avoided.

'At Johnson & Johnson, we are relatively ahead of the game with respect to securing the integrity of the product; specifically biologics products, which require special treatment,' he says. 'We have implemented a holistic programme in order to maintain continuity as much as possible from point-of-manufacture to patient administration.'

Wholesaler distribution

Johnson & Johnson has made concerted efforts to focus on the delivery of products that have left the company's control and entered local distribution channels. Since everyone up to the line of control is required to follow industry-specific guidelines, those areas are considered fairly secure. But a grey area remains with wholesalers who view themselves as customers as well as service providers. Wholesalers regularly distribute mixed shipments, comprising ambient-temperature products and temperature-sensitive biologics, making due diligence imperative.

'Regarding supply chain integrity, the wholesale channel is the biggest concern for us,' says Wegewijs. 'We have contracts in place, which give us the ability to audit our wholesalers and ensure they follow our guidance. But pharma as an industry needs to work together to establish universal guidance on how to properly handle temperature-sensitive products, because in the future most products will be considered temperature-sensitive.'

Johnson & Johnson have implemented an extensive education programme (Figure 1), delivered mainly through existing marketing channels in an attempt to influence those operating outside the company's control. Wegewijs believes the effort has been successful in reaching through the remaining supply chain to the patient, but there is still work to be done. 'We hold industry events internationally,' he says. 'After these events, we go to hospitals to assess the impact our programmes have made.'

Biologics sensitivity

Biologic products in particular need to have temperature control, for example, vaccines or insulin should not be frozen. 'When you freeze these products you get aggregation, which makes the proteins larger and therefore more painful to inject,' explains Wegewijs. 'It also creates the potential for immune reactions within the body.'

One of Johnson & Johnson's most widely used biologics, EPREX, was audited by

JOHNSON & JOHNSON'S SUPPLY CHAIN INTEGRITY COVERS FOUR AREAS

- Product packaging – from anticounterfeiting to temperature regulation and vibration control.
- Qualifications and validations – all of Johnson & Johnson's systems are qualified and validated to ensure all outcomes can be reliably reproduced.
- Guidelines and recommendations – where recommendations are the same as established guidelines, except written for a public audience.
- Marketing materials – this includes all literature distributed by Johnson & Johnson to hospitals and dispensaries worldwide.

Contributor profile

Hugo Wegewijs is senior director European Logistics for Johnson & Johnson's Global Biologics Supply Chain. He has over 36 years' experience with the pharmaceutical industry. In 2002, he established the Cold Chain Committee in Europe. As chair, Wegewijs led the successful cooperation of the Parenteral Drug Association's PCCIG in the US.

Wegewijs and his team with disturbing results. Although EPREX is temperature-controlled and cannot be frozen, the bulk had been transported at an average level of -7°C. The only way that these proteins can remain intact is by maintaining a protected environment. But, typically, the environment required for administration of the drug – injection – is set at the industry standard 228. This means that the product may be stored between 0-15°C.

'If you administer EPREX subcutaneously into a patient, you should take it out of the refrigerator where it is stored and, ideally, the unit syringe is placed at room temperature for 30 minutes before injecting,' says Wegewijs. 'There is nothing wrong with doing this. We can have that product out of the refrigerator at the end of the supply chain for seven days, provided it is kept between 2-25°C. Anything above or below that can damage the product.'

In practice Wegewijs found that people often place the syringe in direct sunlight in order to warm it or put it in the microwave – both practices will destroy the product.

'Also, biologics can leave the pharmacy with the patient to be stored at home in a refrigerator,' he says. 'Most people think the colder the better, but that is not true for all medications. When we come to this part of the supply chain, where we can only influence, education is important because it is impossible to have mandatory guidance. Our goal was to have 100% of people handling our products correctly. We haven't yet achieved that goal, but we've come a long way.'

Difficult situations

Even with a comprehensive programme, there are circumstances that cannot be anticipated. War, natural disaster and terrorist attacks can all disrupt normal distribution chains.

'War does not affect ambient temperature supply chains so much, but it does affect products that need special handling,' says Wegewijs.

For example, Johnson & Johnson ship to Iraq, which is still in a difficult situation. If the company was only dealing with ambient-temperature products, it would not be a major issue. But biologics require special precautions to make sure the products arrive in good shape at the Iraq Ministry of Health. From there it will be distributed within the country and from that point it is out of the company's control.

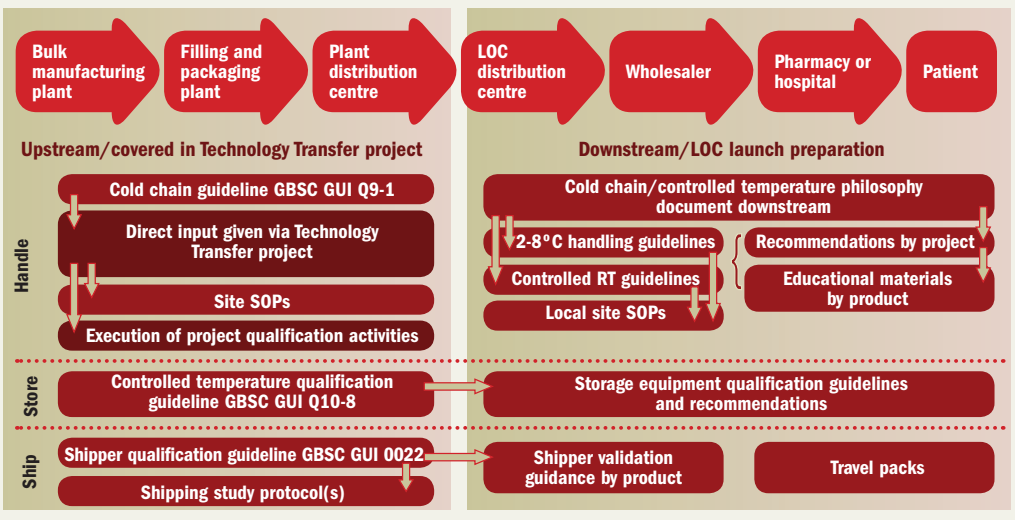
'We've had extensive talks with governments to make sure they are aware of the problems that can occur during shipping, which are outside our area of control,' Wegewijs continues. 'Our shipping system is very robust and it has some safety margin, which we are making use of. We can add more temperature recorders in the shipment so we can assess what happens during the shipment.'

In war situations, the impact of shipping products must be assessed to work out how much risk is involved to ensure that patients receive a safe product. 'If we are in doubt, or if we can't control the use of the product, then it would be considered a major risk and we may decide not to ship,' says Wegewijs. 'In these scenarios, specific questions need to be asked.'

Incidents such as the 9/11 terrorist attacks in New York can create a unique set of challenges. For example, Johnson & Johnson had shipments en route to the US from Holland. These were pre-formulated bulk shipments that had to be further processed in the US for administration. Several shipments were on the way, by plane, at the moment the government closed US airspace, so no planes were allowed to enter or exit.

'We had to find out where that plane went,' says Wegewijs. 'This was a bulk shipment with a large cost value of around $5-6 million. We were not only tracking them, but also making special precautions to save the shipment so it could eventually arrive in the US. In this case, we were able to direct our foreign agents to take the shipment off the flight and refrigerate it.'

Figure 1. End-to-end SCI guidance documents.



Preparation measures

Wegewijs believes there is very little that pharmaceutical companies can do to prepare for extreme situations. 'When something like 9/11 happens, you are not protected,' he says. 'We have regular systems in place, but in these cases we are in a reactive mode. We always look at the shipments going out and examine what risks are involved in the transportation process. Sometimes, if products exceed their safety guidelines and targets, we ask the receivers to discard the entire shipment because if we have no control or knowledge of what has happened in transit, specifically if we are going to be outside of our validated systems by a significant amount, then it's over.'

Johnson & Johnson's validated systems run for approximately 96 hours so that it can take deviations from -20°C to 50°C, though normally a shipment is not exposed to these extremes. In such instances, what happened with the shipment is assessed: the temperature monitors within the shipment are examined to see what air temperatures surrounding the product were reached. From that a decision can be made whether or not the product can be used.

'Our validated systems are passive and the most secure, offering the lowest risk,' says Wegewijs.

If a passive system is in place then there should be no need to re-ice or otherwise care for the shipment. But the environment inside the shipment will still need to be monitored. At the end of the cycle, the whole system can be put in the refrigerator and the sensors will continue to indicate what is happening there. So there are a number of scenarios that have to be examined from situation to situation.

'You can prepare specifically to minimise the risk if you are shipping to a volatile area,' says Wegewijs.

For example, there are no direct flights out of Europe to Iraq, so there have been incidents where shipments sent out of Jordan in trucks to Baghdad have been taken by criminals. Situations like this cannot be controlled, which means that a decision needs to be made whether to ship or not.

'However, our biologic products have little illegal market value,' says Wegewijs. 'Although they are very expensive, they are illness-specific. We are prepared, but every shipment will require a different approach, depending on the outlook. You could theoretically anticipate almost all eventual outcomes, but it would certainly be cost-prohibitive.' WPF