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English Summary

Opportunities to Apply Cost Models to Ready-To-Use Drugs in Danish Hospitals

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Background

Increased demand for health care services and higher pressure on the available resources require hospital treatments to be more effective. Such improvement in efficiency may be achieved by reducing duration of admissions, and by treating patients in outpatient clinics or in their own homes. Also, space restrictions require new solutions. Some of the new hospitals that are currently being planned are designed without - or with limited - space for storing and preparing medicine close to patients. Easier preparation and use of ready-to-use (RTU) pharmaceuticals may contribute to improvements in hospital efficiency.

A number of RTU drugs have already been developed and are available on the Danish market. These may already have relieved some of the pressure on hospital resources. However, there are still ample examples of drugs that require preparation immediately prior to the administration to patients. Although RTU drugs are often more expensive than conventionally administered drugs, they require less preparation time before use and potentially offer improved quality of care and better safety for patients and staff. However, saved time, more efficient workflows and increased safety for patients and staff can be difficult to assess and measure and, therefore, it may be difficult to obtain financial savings from RTU-drug in a single instance of patient care. Although clinical departments may not experience immediate savings from the RTU drugs (perhaps even additional costs in the short term), RTU-drugs may potentially offer substantial time and money savings for a whole hospital or region if RTU-drugs were used for more patient care.

Some RTU-medicine solutions have already been introduced in Danish hospitals. An example of this is the patient administered insulin pens and pumps, which have made it possible for patients with diabetes to manage their own daily treatment and thus relieving the need for frequent contacts with health care staff. Other examples are different types of chemotherapy, where patients with the RTU solutions have the opportunity to receive treatment by specially trained home-care nurses at their homes rather than in a hospital setting. Although a number of examples of RTU solutions exists, it is the impression that the potential for further applications are substantial and may offer new ways to improve the efficiency of hospital resources.

It has been an objective of this project to learn more about the issues related to the desirability of the supply side (the pharmaceutical industry) to bring further RTU products to the market and for the demand side (for hospital decision-makers) to demand and purchase RTU products, in order to understand how the market for RTU product might be further developed with new RTU products

and increased demand. However, although both good will and faith may be important, it could also be necessary for the pharmaceutical industry to increase their supply and range of RTU-drugs for which positive business cases exist.

A large part of this project was focused on assessing the resource and cost implications of RTU solutions. As part of this project, we have developed and tested a cost model that could be used to identify and describe the costs and savings relating to the use of RTU drugs in comparison with applications of the same drug in a traditional administration form. In this way, we have shown one direction that will help both the pharmaceutical industry and policy makers to identify effective courses of treatments, where RTU solutions may offer efficiency gains, and where the total cost can be compared with and without application of RTU solutions.

Project Summary

The project "Ready-to-use medicine solutions: Analysis of the opportunities, challenges and economic potential", was launched in the autumn of 2014 by the Ministry of Business and Growth in collaboration with Danish Regions (the interest organisation for the five Danish regions) and Amgros (the pharmaceutical procurement service for the five regional health authorities).

The objective of the project was to explore different factors that may be important for the future applications of RTU medicine solutions in the Danish Hospitals. Based on interviews with representatives from the pharmaceutical industry, it was estimated that a single-sided focus on the purchase price of drugs (and selection of the cheapest product) is hindering the development of a wide range of supplies of RTU drugs. This can be attributed to the market maturation of RTU solutions often is associated with substantial costs that the industry should be able to recoup from their sales. Therefore, it may be expected that these market maturation costs to some extent will influence the market price, so that RTU solutions – everything else being equal - would have a higher purchase price than traditional solutions. This is especially true for products that are already available for traditional administration (non-RTU).

It has been argued that if assessment and purchasing decisions are made on basis of total costs of the drug treatment - rather than only on the purchase price of the drug – there would be wider resource and cost implications when the supply of RTU solutions become larger. If purchasing decisions is made in relation to the total cost, i.e. both purchase price and costs for handling and treatment with drugs, then the additional cost of purchasing RTU solutions will in some cases be offset by savings in staff and patient time. In addition to such savings, the RTU solutions may offer greater patient safety and better working environment for hospital staff. Furthermore, longer shelf lives for RTU-products may result in reduced waste and thus offer additional savings in procurement and storage.

In the interviews conducted, representatives of the pharmaceutical industry called for clearer signals of the extent to which the Danish health authorities are willing to pay a higher purchase

price for drugs that are easier and safer for staff to handle, and which may be associated with lower risk of medication errors and better working environment.

Representatives from the hospital system gave the impression that although the pressure on hospital resources is large, it may be difficult to achieve staff savings from reductions in many small work tasks. If that is the case savings in staff time from few tasks related to the preparation of drugs should lower costs or increase the activity, the potential net savings should be considerable before hospitals have sufficient incentives to switch to RTU solutions. The difficulty to carry out an adjustment of personnel capacity due to already very large staff workload was another problem acknowledged in the interviews. Therefore, staff reductions in a bed ward may also have serious consequences for other tasks and, therefore, the potential saving in staff time from RTU drugs may be difficult to realize.

From the interviews conducted, it was clear that hospitals generally wanted the private pharmaceutical industry to produce as many of the sought-after drugs as possible. Although hospital pharmacies can handle some production and preparation, it was described as a clear advantage, if a larger range of the current products could be delivered as RTU from the pharmaceutical industry. This was perceived to provide advantages in relation to purchasing and logistics as well as the longer shelf lives RTU drugs typically have compared to medicinal products prepared in a hospital section or at the hospital pharmacy. The longer shelf life provides, inter alia, opportunities for savings in the form of reduced drug waste.

The project developed a process by which potential resource and cost savings from RTU solutions can be calculated. Here, the possible additional costs of the RTU solution will be offset by potential savings in staff time, fewer consumables, reduced need for physical space and infusion places, and savings in patient time. Such calculations may help to clarify the potential consequences of RTU solutions and provide an estimate of the resource and cost impact to the hospital system.

Such calculations of potential savings were illustrated in a number of case studies where it was assumed that there can be full capacity adjustments, i.e. the staff time savings will be realized in full. In a case study with Lucentis a potential time saving of around 30 seconds was identified in a total treatment time of 10-15 minutes. If this was the case, any additional costs of the RTU solution could be offset by savings in staff costs. However, in this particular instance it may be difficult to realize such a small time saving.

If 17-18 daily treatments were performed on a single "sticking room", then the potential time saving – everything else being equal – might enable staff to treat an additional patient per day. However, that would have consequences for the hospital's medicine expenses as they it would increase with the additional treatment. In this example, applications of the RTU solution would mean that more patients can be treated within the same personnel resources, but that would impose additional costs for drug purchasing.

The Herceptin case study provides an example of a RTU solution that may be cheaper to use than the traditional solution when the saving of staff time is included in the cost analysis. If the drug was used subcutaneously rather than in intravenous form, there may be a significant time saving compared to the preparation and administration of the drug. If 100 patients treated with the drug subcutaneously rather than intravenously (17-18 infusions per patient), then the illustrative cost model shows a potential saving of around 1 million DKK in saved staff costs. In addition, there would be additional saving from the reduced need of physical space in the outpatient clinic (patients are discharged faster) and spared treatment time for patients.

In the anaesthesia case study, it was assumed that the task of preparing the drugs could be shifted from the nurses in the day surgery clinic to the staff at the hospital pharmacy. This study showed that the RTU solution was associated with higher costs as the hospital pharmacy imposed additional costs to drug preparation equipment, and because the production must be conducted under more controlled conditions than in the clinic. In addition, there were extra costs related to transport of drugs from the hospital pharmacy to the outpatient and bed wards. The additional cost for that day surgery section was assessed to be in the order of 600,000 DKK per year, representing a nearly doubling of the cost of anaesthetics. In addition to relieving nurses for particular preparation tasks, the use of RTU solutions might lead to improved quality of patient care and better working environment for nurses.

One of the substantial potential savings from RTU solutions may occur if the RTU solutions made it possible to discharge patients earlier from the hospital, or if hospital admissions/visits could be avoided altogether. There are a number of examples from the treatment within endocrinology, rheumatology and oncology, where RTU solutions have reduced staff time by enabling patients to apply “pens” for their own medication, or where a nurse was able to provide the drug administration in the home of patients.

The opportunities of realising staff savings will obviously be determined locally. In a situation where all drugs are used in RTU form, the potential staff saving might be substantial and feasible, and there might also be other opportunities for savings related to, for example, the need for physical space for drug preparation and storage.

Perspectives

If the use of RTU drugs is to be promoted in the Danish hospital system, there is a need for both the pharmaceutical industry as well as hospital pharmacies, respectively, to market and manufacture a wider range of RTU products.

A closer dialogue between the demand (hospital) and manufacturing (industrial and hospital pharmacy) side could help to clarify which types of drugs might be in most demand and which are possible to get manufactured from either industry or hospital pharmacy, and the extent of willingness to pay for RTU products.

In addition, a discussion of the options for documenting and valuing any savings from using RTU solutions in terms of for example, fewer complications and reduced risk of errors, and better working conditions may also be relevant. It will be particularly relevant to focus on drugs that may enable earlier discharges from hospitals, as this could relieve the pressure on hospitals' bed capacity, thus reducing hospital costs.

There is a need to adopt a more careful assessment of the treatment costs that not only considers the purchase price for the drug, but where also the potential savings from the RTU solution are recognized as a competitive factor. The completed case studies have illustrated the principles that should be used to devise the relevant cost analysis.

Based on the principles developed for cost assessment of RTU drugs, it would be appropriate to test these in specific Amgro's procurement. Through specific applications in future tenders there will be obtained experience in the development and application of the general principles to assess the costs of different types of drugs.

The described principles for cost assessment are not limited to RTU drugs, but can be used to assess costs for a wide range of drugs. A special problem concerns the use of RTU drugs to designated patients that might be treated at home. Here, hospital departments are responsible for the patient care in the homes. By using RTU drugs for such patients, the drug delivery could be made by hospital staff or municipal staff nurses or in some cases by the patient, if necessary, with the support of the relatives. There are examples in oncological treatment where, for example, the chemotherapeutic treatment occurs in patients' home with the use of RTU solutions. Another example is treatment with antibiotics in a RTU solution where patients after an initial medication phase are discharged at home for continued treatment, assisted by local nurses.

There are a number of economic and budgetary conditions that limit the application of RTU solutions.

During this project some of these conditions have been identified, but it is not completely understood, to what extent the regional committees of pharmaceutical care varies for different regions and hospitals in their principles to recommend the use of RTU solutions. Regional and local drug committees appear to be key stakeholders in relation to increasing the use of RTU drugs, but the organization of drug committees and their influence varies. In a future analysis, it may be appropriate to more thoroughly examine the opportunities and incentives these committees have to encourage or discourage the use of RTU drugs.

Moreover, it is clear that the principles employed in the pharmaceutical budgets at individual hospitals also may vary, and may offer different incentives for application of RTU solutions. It is clear that both the financial and other incentives for increased use of RTU solutions should be subject to further analysis.

While there are a number of examples of successfully marketed RTU solutions, the potential for new solutions appear to be large. For expensive drugs used in limited amount, the additional costs of RTU solutions may be relatively modest, since the drug compounds are expensive. It is clear, that the industry has further reasons to focus their development and marketing of RTU solutions for these expensive drugs.

On the production side there are apparently weaker incentives to develop RTU solutions for cheaper and frequently used drugs. It has been argued that although the Danish hospitals offer an interesting market opportunity giving a certain level of willingness to pay for RTU solutions; it is also for this type of drugs, that the potential of the Denmark market is insufficient and unattractive for greater private investment in the development of RTU solutions. This may lead to RTU solutions offered at relatively high costs, which not only restricts the hospital demand, but also limits the revenue potential of the Danish, Nordic or European market. If the market for RTU solutions were considered in a larger scale, for example, in relation to the European market, it is expected that there could potentially emerge better opportunities for mass production and economies of scale with lower prices for RTU solutions.

In relation to the requirements for registration of pharmaceuticals, Denmark has in some areas tighter regulatory requirements than other countries in Europe. It may be speculated that the Danish rules are too restrictive or whether it should be expected that the Danish rules will eventually be adapted by other European countries. If the latter is the case, the Danish hospitals might be in the first wave of development of RTU solutions and thus have an important influence in which areas that the developmental should be in front. This will require that hospitals demonstrate willingness to take risks and willingness to finance early innovation processes in order to increase the supply of RTU solutions.