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Objective of your solution: (Briefly define the primary outcome of your solution to this challenge):

1. The main objective is to achieve a comprehensive paradigm shift in oncology care by transitioning from resource-intensive intravenous infusions to patient-centric, high-efficiency subcutaneous injections.
2. Optimising clinical efficacy and maximising health system throughput.
3. Eradicating "time toxicity" to restore treatment-free time and quality of life to the patient.
4. For resource optimisation and Economic benefits.

Describe your solution / proposal: Provide a detailed account of your solution/ proposal to this challenge. You could type your solution/ proposal here. (Disclaimer: Solution/proposal should not exceed more than 300 words.):

Pharmacological Advantages: 1. Proven Bioequivalence: SC formulations have demonstrated non-inferior pharmacokinetics compared to intravenous. 2. Phase 3 trials, show equivocal objective response rates and efficacy 3. Comparable Safety Profile with less infusion related reactions 4. Reduces Catheter-Related Complications like infections and thrombosis 5. Facilitation of fixed-dose combinations (e.g., pertuzumab and trastuzumab),

Resource Optimization 1. Reduction in Preparation and administration time 2. Optimized Healthcare Professional Time: from reducing time from line setup and to monitoring prolonged infusions. 3. Increases Day care Unit Capacity 4. Simplified Logistics: The "ready-to-use" nature of many SC injections simplifies the supply chain.

Economic Benefits 1. Decreases Preparation and administration Cost 2. Minimized Drug Wastage 3. Reduced Productivity Loss: Because treatments are faster, patients experience less toxicity, leading to fewer lost workdays and less disruption to their professional lives. 4. Lesser Travel and Caregiver Expenses 5. Optimized Quality of Care 6. Decreases patient anxiety and improves comfort.

Challenges and mechanisms to address these 1. More protein concentration: leads to higher viscosity, Viscosity Reducers like arginine, caffeine, or proline suppresses protein-protein interactions. 2. More Protein Aggregation: Formulating mAbs as crystalline suspensions provides superior physical-chemical stability and retains full biological activity. 3. Decreased solubility: By modulating pH and ionic strength alters the electric charge of amino acid residues, mitigating attraction between antibodies. 4. Transitioning from IV to SC is more complex and costlier than maintaining the original concentration. Using On-Body Delivery Systems allows for low-concentration, large-volume formulations. 5. Extracellular Matrix Resistance: dense, negatively charged hyaluronic acid network in the hypodermis acts as a barrier to drug transport. Can be reduced by using recombinant human hyaluronidase temporarily degrades hyaluronic acid. 6. Injection Site Pain can be reduced by Thermosensitive Hydrogels. 7. Lower Bioavailability: By using higher total doses to ensure equivalent systemic exposure. 8. Target-Specific Toxicity: mAbs like Cetuximab are unsuitable for SC due to high EGFR expression in the skin, leading to severe toxicity. Can be avoided by selecting candidates based on molecular target distribution.