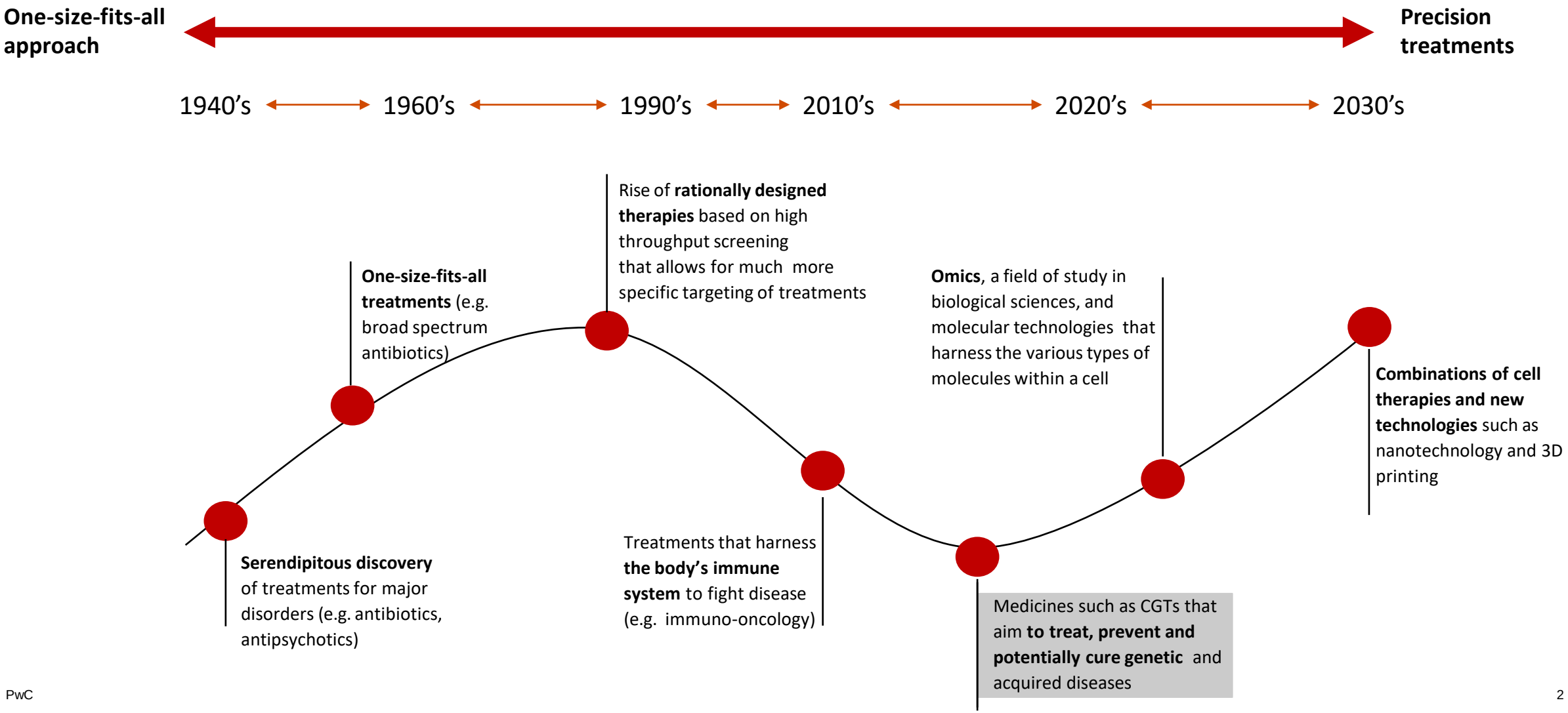
Opportunities and challenges with CGT adoption in Ireland

March 10th 2022

Dr. Shane Gannon

pwc

Medical innovation is progressing at an increasingly pace from a “one-size-fits-all” approach towards precision treatments tailored to patients

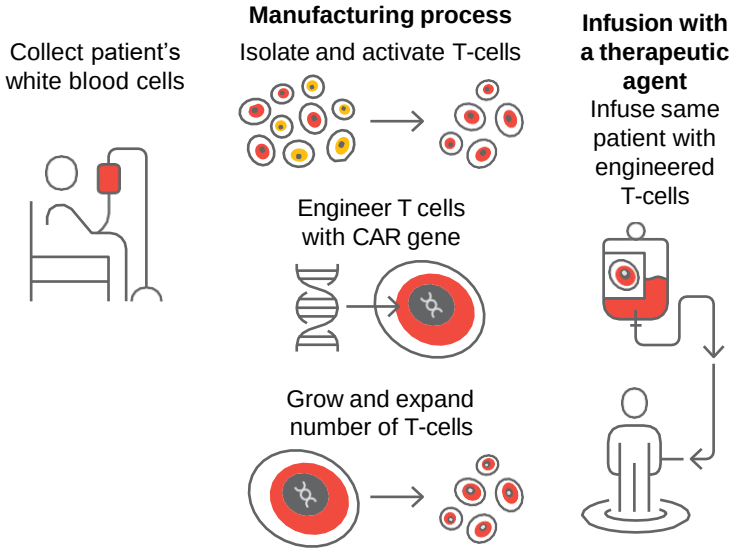


CGTs are a new category of precision medicine that aim to treat, prevent and potentially cure disease

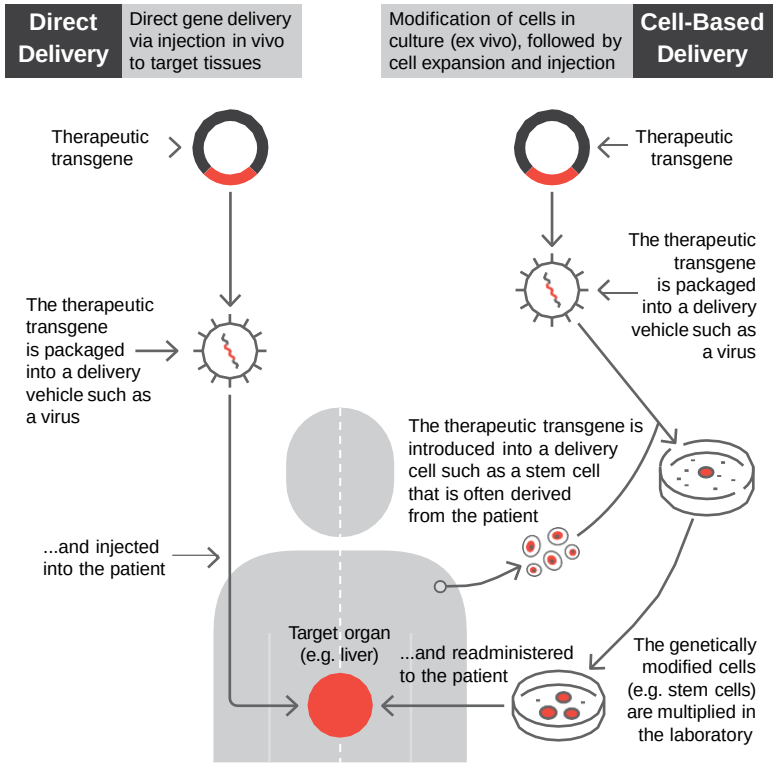
Cell Therapy

Cell therapy aims to introduce new, healthy cells into a patient's body to replace diseased or missing cells. One of the most advanced forms of cell therapy is CAR-T treatment for different types of blood cancer.

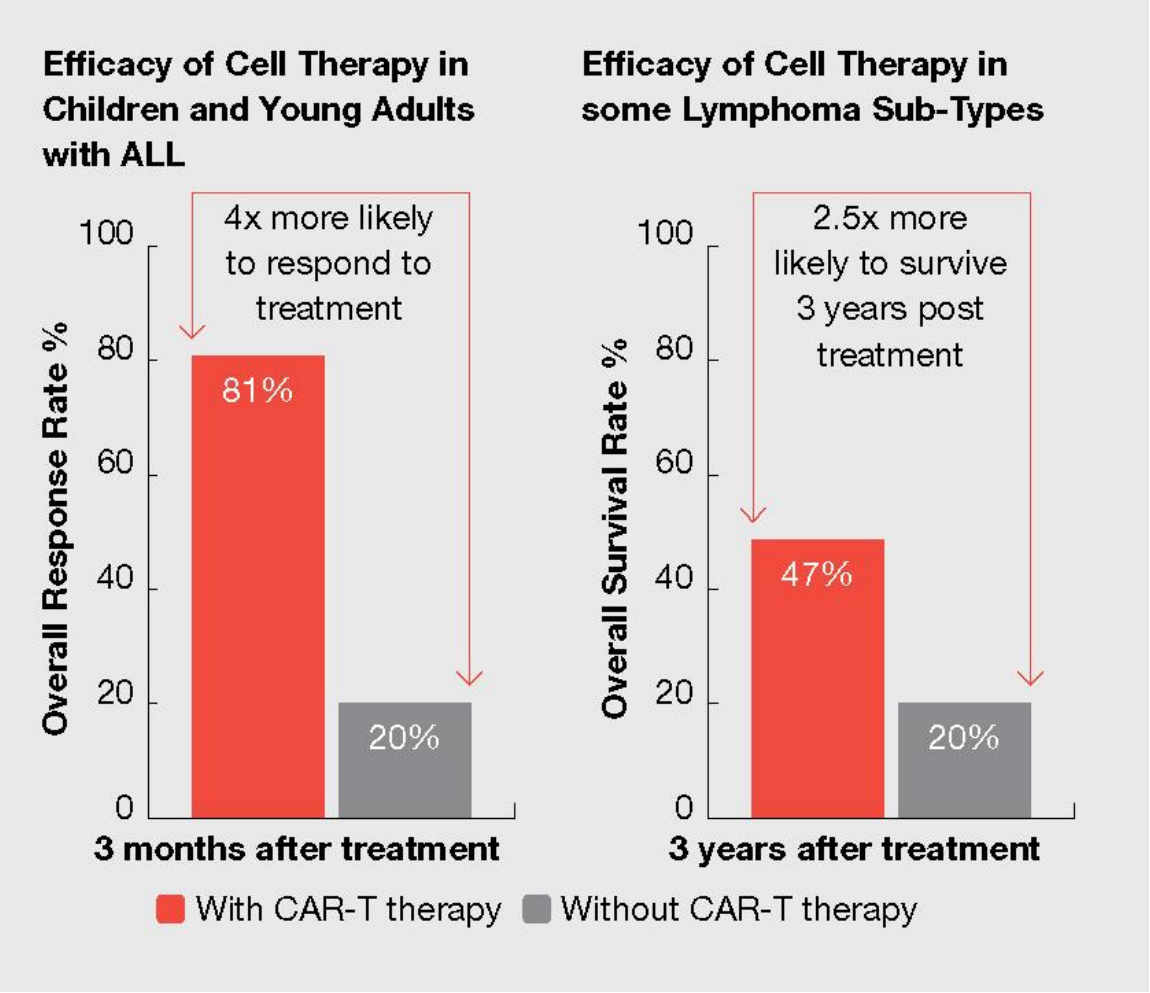
The CAR-T Process Leukapheresis



Gene Therapy

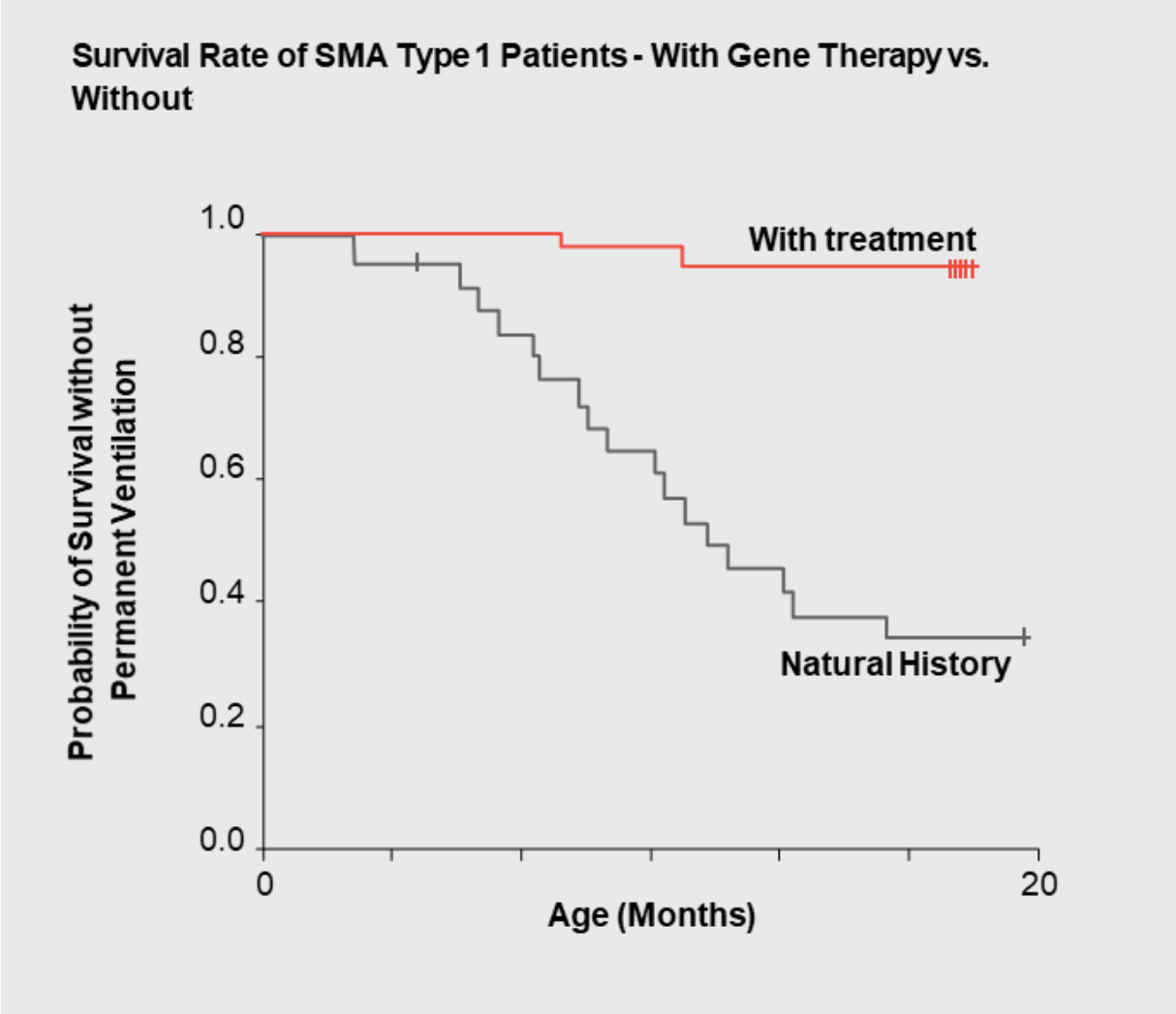


CAR-T therapy has the potential to improve overall patient survival in certain blood cancer patients



- Cell therapy, or ‘CAR-T’ therapy, is used to treat certain blood cancers in which patients have failed to respond to all conventional treatment options.
- CAR-T is administered as a one-time treatment in which a patient’s T cells are removed from their blood and modified in a lab so they will attack cancer cells.

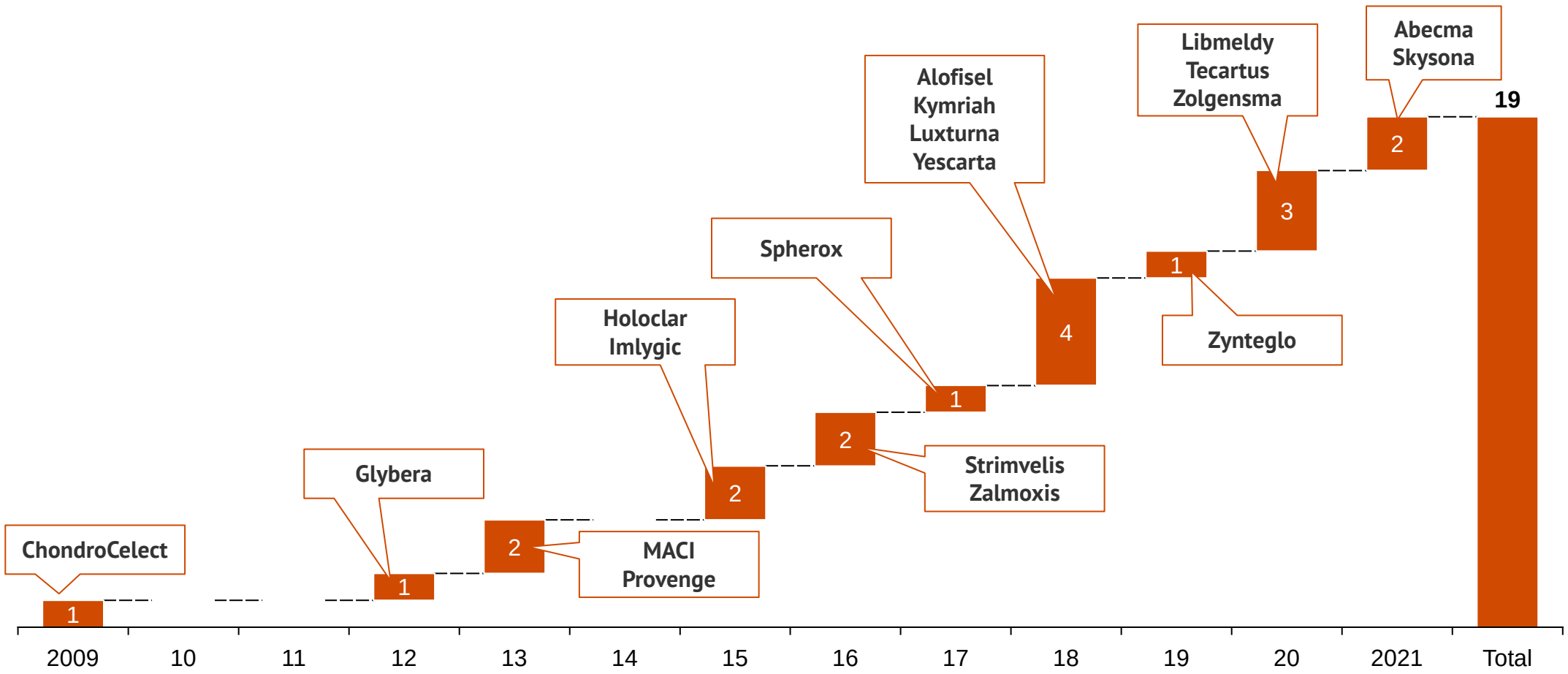
Gene Therapy treatments of Spinal Muscular Atrophy can modify the course of the disease



- Spinal Muscular Atrophy (SMA) is a rare, genetic neuromuscular disease caused that results in the progressive and irreversible loss of motor neurons, affecting muscle functions, including breathing, swallowing and basic movement
- If left untreated, SMA Type 1 leads to death or the need for permanent ventilation by the age of two in more than 90% of cases.

The volume of CGT approvals in Europe is increasing….

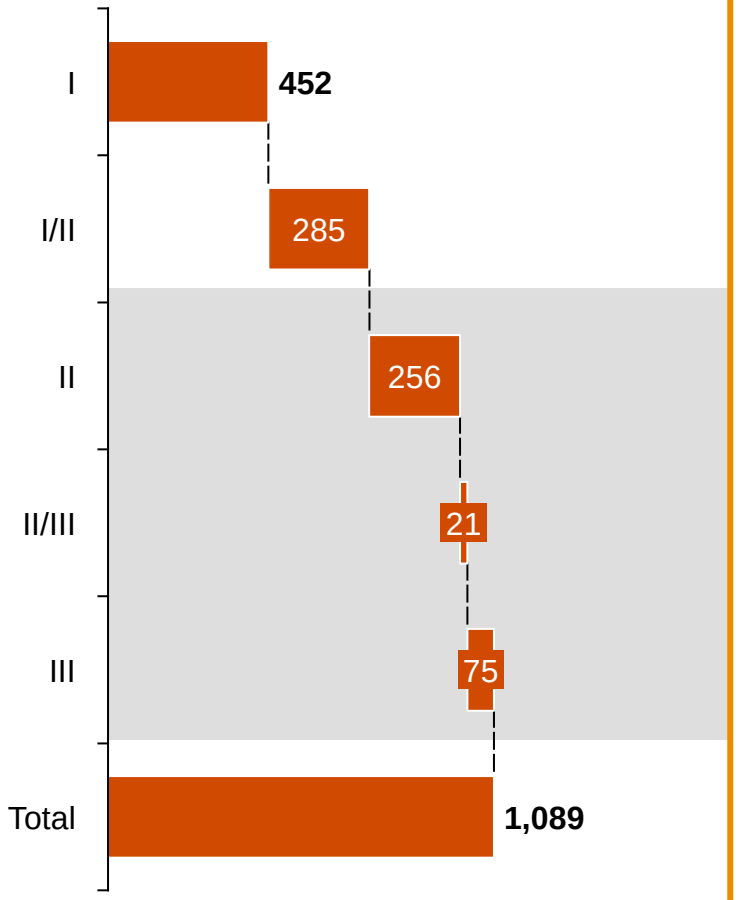
Total number of EU CGT approvals by date of issue of Marketing Authorisation



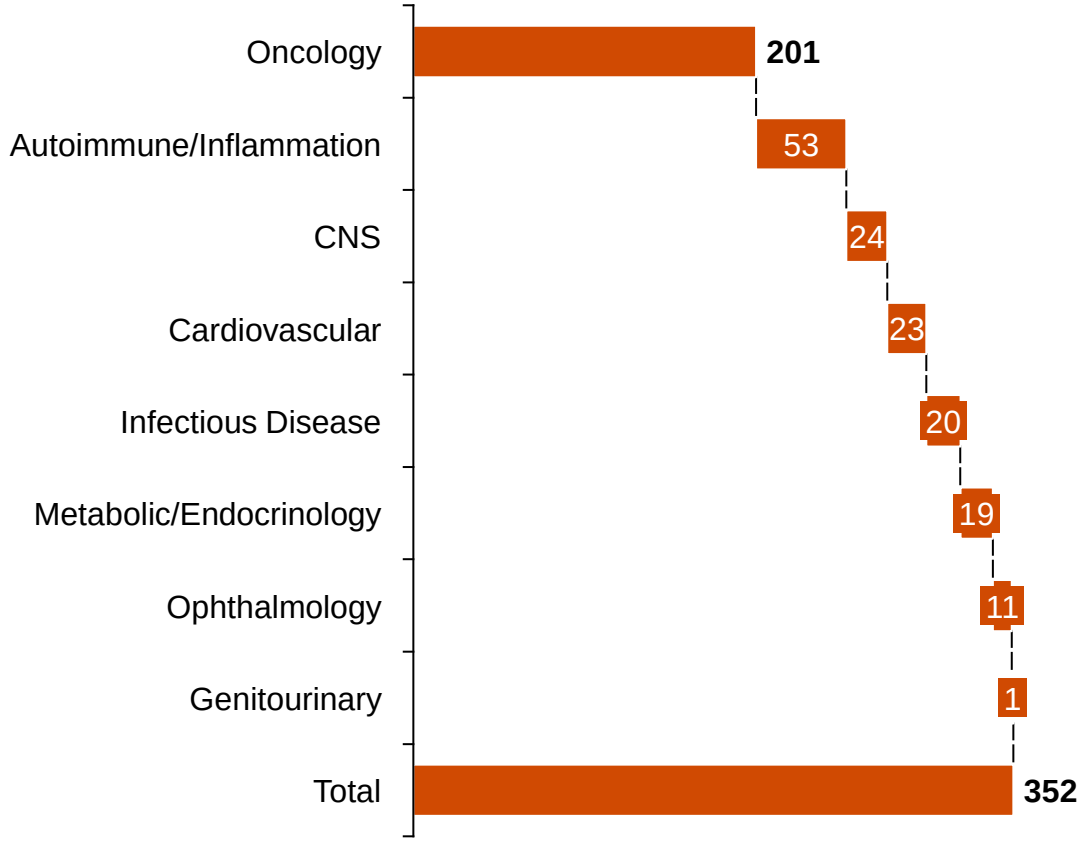
Source: Informa Pharavitae, Informa Datamonitor, EMA

.....and there is ongoing significant clinical trial activity particularly in Oncology....

Total number of ongoing CGT trials with a biopharma sponsor



Trial breakdown by therapeutic area



Source: Pharmaprojects

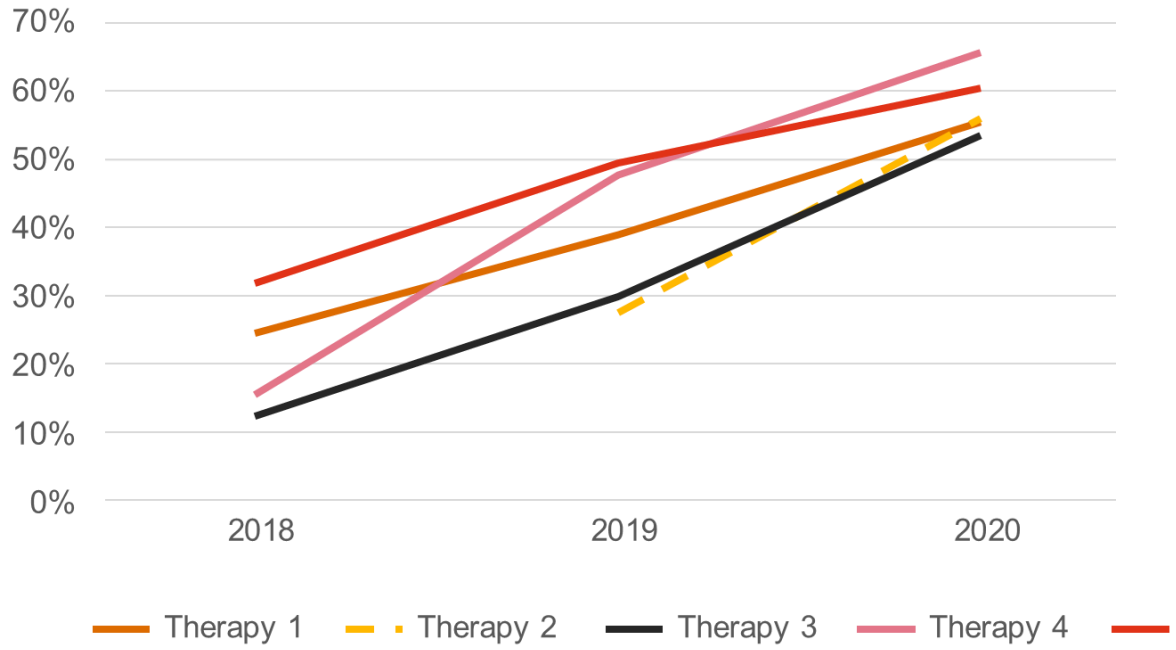
….but patient numbers are relatively small or treatment eligibility is restricted

Therapeutic area	Example illness	Estimated total number of Irish patients	Eligibility for treatment
Cancer	Leukaemia	~5,700	• 3rd line therapy used after after two or more chemoimmunotherapy regimens have proven ineffective
	Lymphomas	~11,000	
Ophthalmology	Retinitis pigmentosa	~1,200	• Patients still have enough functioning cells left in the retina and a form of the disease caused by mutations in the RPE65 gene
Neurology	Spinal muscular atrophy	~55	• Patients have inherited mutations affecting SMN1 gene or have up to 3 copies of the SMN2 gene
Endocrinology	Crohn’s disease	~11,000	• Complex perianal fistulas in patients with Crohn's disease
	Metachromatic leukodystrophy	~9	• Infants or early juveniles who either have no symptoms or can still walk independently and have not yet developed mental deterioration.

CGT commercialisation has proven challenging to date

Gene therapies have seen slower growth in sales after launch

Projected and actual sales as a percentage of projected peak sales



There have been several withdrawals of CGTs from the European market

bluebirdbio™

Bluebird, winding down in Europe, withdraws another rare disease gene therapy

MOLMED

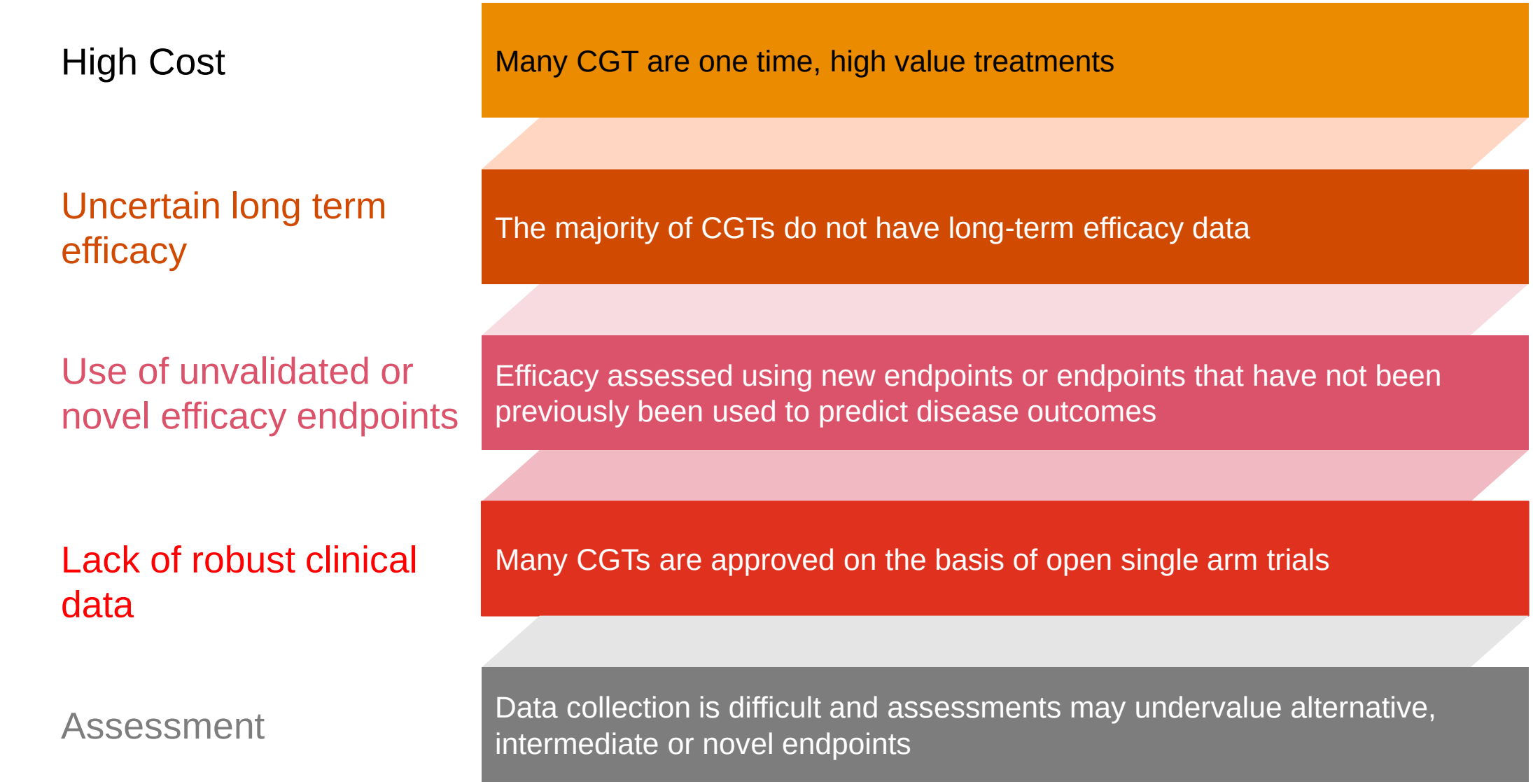
Disappointing End For MolMed's Zalmoxis Cell Therapy In EU

Dendreon

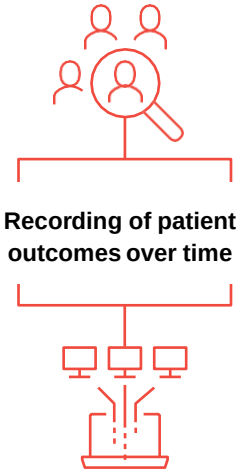
Provenge – Withdrawal of the marketing authorisation in the European Union

Source: PwC Health Research Institute

Primarily because CGTs pose several challenges when it comes to reimbursement



Alternate funding models are a way of addressing some of these limitations

Payment Model	Key Features	Example markets in use	Enablers
Annuity-based model - staged payments	Payment is spread over a number of years in a pre-agreed payment plan, linked to individual patient outcomes	• Italy • Spain	
Coverage with evidence development	Future price reassessment based on longer-term follow up data from pivotal trials and real-world use in patients	• France • United Kingdom	
Outcomes-based rebates	Rebates from pharmaceutical company to government based on individual patient outcomes	• Germany	
Blended annuity-style payments with rebates	Instalments over several years, with outcomes based rebates based on patient outcomes	• United States	

Recommendations

A number of urgent steps can be taken to ensure Irish patients gain access to innovative and potentially life-changing therapies over the coming years.

Cell and Gene Therapy Assessment Framework	**A CGT adoption policy which draws together proposals for tackling the related strands of assessment, access and reimbursement**
Novel Reimbursement Models	**Introduce novel reimbursement models for CGTs to ensure broad access and value for money for Irish patients**
Efficacy data	**Improve the data infrastructure for key disorders likely to benefit from CGTs in the short term and start planning for a broader rollout in other areas in the medium term**
Expertise and Resources	**Continue to invest in facilities and staff while ensuring training and engagement with clinicians and patients to allow for a smooth national rollout of CGTs**

Thank you

pwc.com