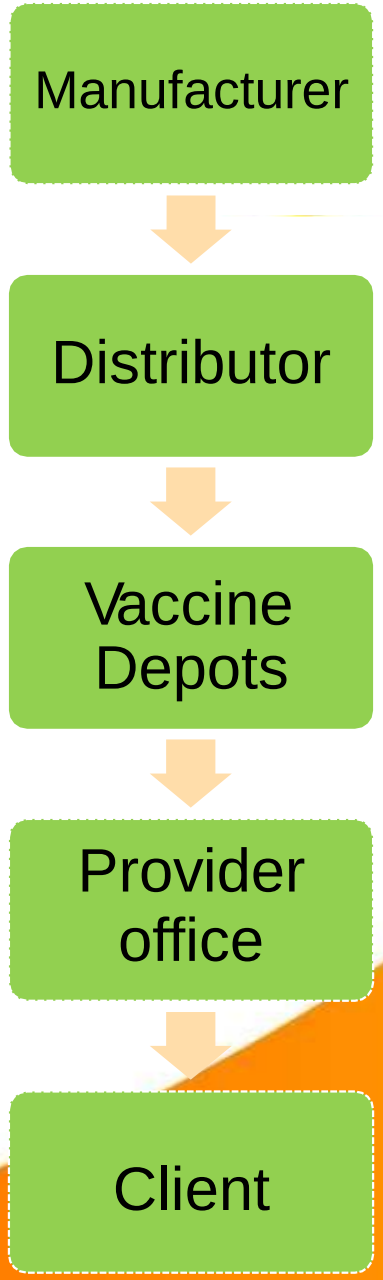
COLD CHAIN

Cold Chain

*The **'cold chain'** is the system of transporting and storing vaccines at recommended temperature from the point of manufacture to the point of use.*



Why is the cold chain important ?

1. Vaccines are:

- Biological products
- lose potency with time
- Process irreversible and accelerated if proper storage conditions are not adhered to.

2. Assurance in potent product and vaccine programmes

- ***Professional responsibility***

✓ *Confident the vaccines you give will be effective*

- ***Public Health responsibility***

✓ *Public confidence in immunisation programmes*

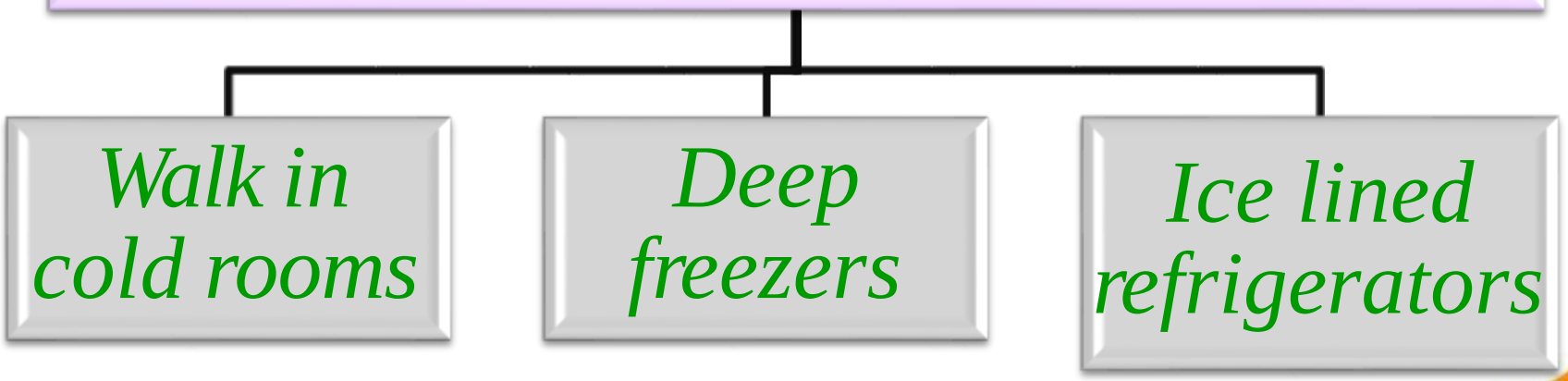
3. Ensuring maximum benefit from immunisations

- Responsibility not to waste scarce NHS resources
- Reduce wastage from errors

4.Compliance with SPC/Manufacturer

- *Any vaccine that has not been stored at a temperature of 2-8ºC as per its licensing conditions is no longer a licensed product*

Cold chain storage equipment



1.Walk in cold rooms(WIC)

- At regional level
- Storage up to 3 months

2.Deep freezers

- *At district & PHC levels*
- *Temp :- -15^{o}c to -25^{o}c*
- *At PHC, used only for the preparation of ice packs*

3.Ice lined refrigerators(ILR)

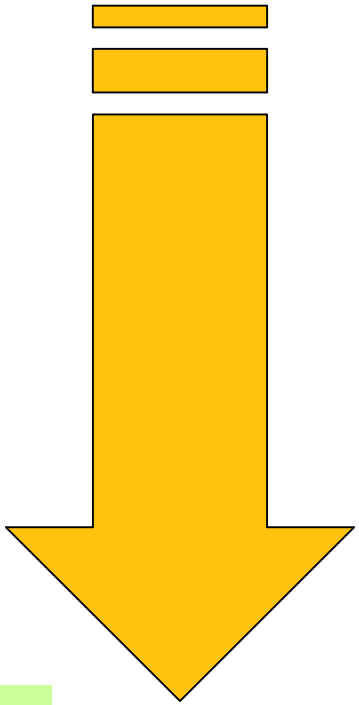
- *Both at district and PHC levels*
- *Temp :- +2^{o}c to +8^{o}c*
- *ILR's are top opening, can hold cold air inside better than front opening refrigerators*

Vaccine Stability

MOST SENSITIVE

Sensitivity to HEAT

- *BCG*
- *Varicella*
- *MMR*
- *MenC*
- *Hepatitis B*
- *DT and/or aP/IPV/HIB*



Sensitivity to COLD

- *HepB and combination*
- *DTand/or aP/IPV/HIB*
- *Influenza*
- *MenC*
- **MMR*
- **Varicella*
- **BCG*

LEAST SENSITIVE

*(*Freeze dried)*

✓ *Temperature must be recorded twice in a day with dial thermometer*

Light Sensitive

Sensitive to strong light, sunlight, ultraviolet, fluorescents (neon)

BCG

MMR

Varicella

Meningococcal C Conjugate

Most DTaP containing vaccines

Vaccines should always be stored in their original packaging until point of use to protect them from light

Vaccine Storage

DON'T's

X No food or medical specimens

X Do not place fridge in direct sunlight or near heat source

X Do not store vaccines for more than 1 month at PHC.

X Do not store vaccines in fridge doors or in solid plastic trays/containers within the fridge

X Keep vaccines away from fridge walls and cold air vents

Picture taken from www.medisave.co.uk

DO's

✓Use a dedicated vaccine fridge

✓Safeguard electricity supply

✓No more than 50% full

✓Place vaccines in clearly labelled plastic mesh baskets

✓Group vaccines by type (Paediatric, Adult, Adolescent)

✓Defrost/calibrate fridge regularly

✓Ensure back up facilities are available in the event of fridge failing

Transporting Equipment

- *Cold boxes*
- *Vaccine carriers*
- *Day carriers*

1.Cold boxes

- *Used for transport of vaccines*
- *Fully frozen ice packs placed at the bottom and sides*
- *DPT, TT, DT should not be kept in direct contact*

2.Vaccine carriers

- *Used to carry small quantity of vaccines(16 to 20 vials)*
- *For out of reach sessions*
- *4 icepacks are used*

3.Day carriers

- *Used to carry very small quantities of vaccines(6 to 8 vials)*
- *For a near by session*
- *2 icepacks are used*
- *For only 2 hours period*

Use of diluents

- ✓ Specifically designed to reconstitute the vaccines with respect to volume, pH and other chemical properties
- ✓ Store at +2°c to +8°c in ILR
- ✓ Only use vaccines suppled and packaged by manufacturer

Vaccine Vial Monitor(VVM)

VVM *is a label containing heat sensitive material that is placed on a vaccine vial to register heat exposure over time*

Vaccine vial monitor

Stage 1

- Inner square lighter than outer circle

Stage 2

- Inner square still lighter than outer circle

Stage 3

- Color of inner square matches the outer circle

Stage 4

- Color of inner square darker than outer circle

✓Combined effects of time and temperature cause the inner square to darken gradually and irreversibly

✓VVM does not directly measure the vaccine potency but gives info about the main factor that affects potency