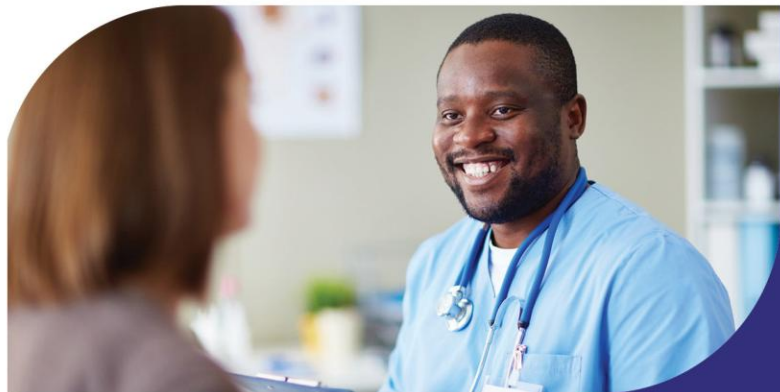




HSA

An tÚdarás Sláinte agus Sábháilteachta
Health and Safety Authority

Prestress/Precast Concrete Campaign



Inspector - Brendan Kelly

Date -19/09/2025

Housekeeping



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- Approx 20 Minute Presentation
- Questions at the end

Background



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- National sectoral team for all Manufacturing set up in 2022
- Campaigns in other sectors to date – dairy sector, meat plants, metal fabrication.
- Prestressed/Precast concrete industry – important economic sector and large employer
- Previous Prestress campaigns in 2016 and 2021.

Campaign focus



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- Two-week campaign starting the 29th of September.
- Assess how you manage prestressing of concrete and precast on your site.
- Gather information and data
- Provide advice and guidance

Format of Inspection

- Unannounced inspections
- Request to speak to person in charge/in charge of safety
- Look to speak with Safety Representative
- Review safety documentation
- Inspect workplace including equipment, activities
- Not an Audit
- Enforcement – Verbal Advice, Written Advice, Improvement Notice, Prohibition Notice

Incidents by Trigger



1651
Incidents



Prestressing of concrete.

Safety Statement/Risk Assessments



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- Site specific Safety Statement and risk assessments.
- Is there a risk assessment in place for prestressing of concrete and destressing of concrete.
- Is there risk assessments in place for precast concrete processes.
- Has the risk assessments been communicated to all staff involved in these processes.

What are the risks?

- Risk Assessments not carried out.
- Failure of a tensioned wire injuring those in the path due to failed barrels and wedges
- Failure to absorb the energy following failure behind the stressing zone
- Risk of injury from rail mounted vehicles
- High levels of traffic movements in relatively confined areas
- Use of Conveyors and Pan Mixers

The Hazards of Prestressing Steel Wire



Instruction/Training

- Staff must be instructed on how to operate machines safely e.g.: Risk assessment/safe systems of work, training.
 - Risk assessments clearly defined and accessible
 - Records available showing that staff have been made aware
- Training records should be in place for safe use of work equipment
 - Are comprehensive training records maintained for the safe use of all work equipment
 - Induction Training
 - Training plan in place for Apprentices
 - Translated to employees who don't have English as their first language.

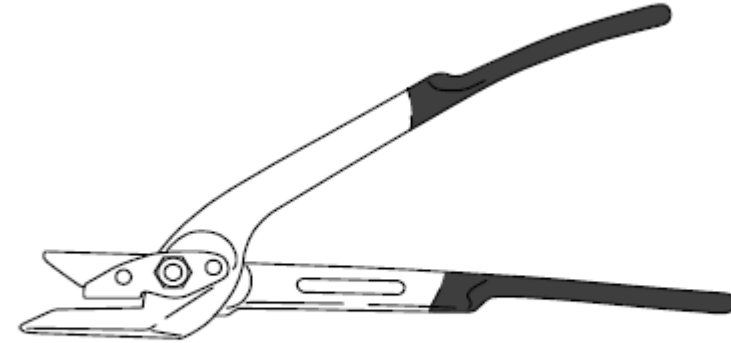
Storage and handling of steel wire

Storage

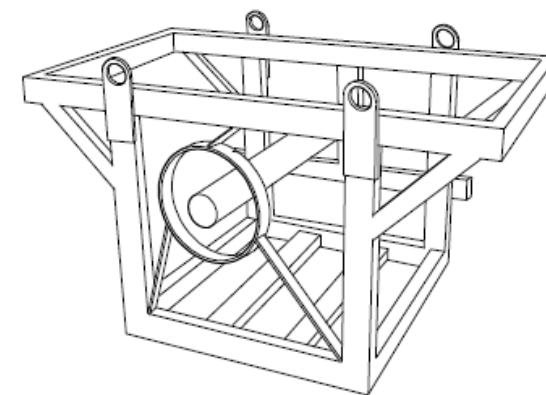
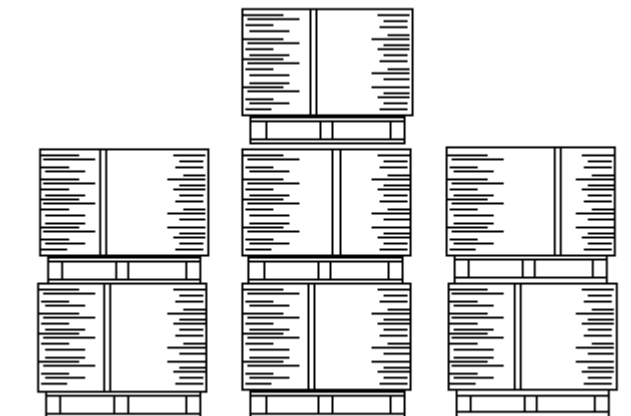
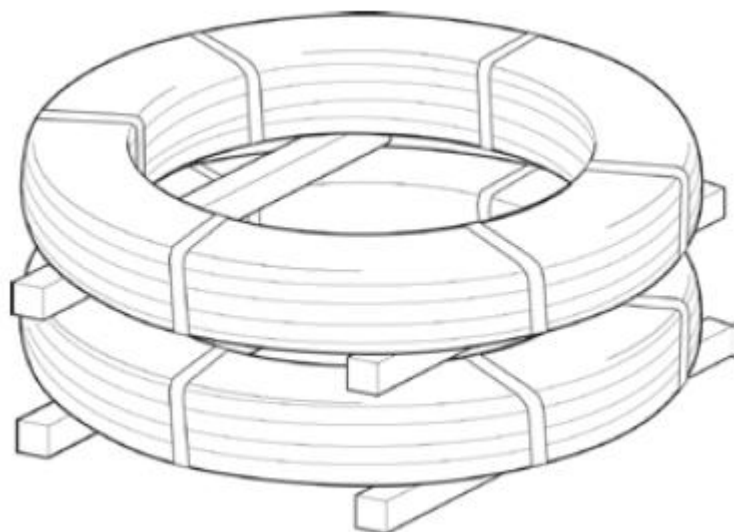
- Fibre Slings
- Rubber on Forklift arms
- Not stored on ground
- Covered if outside
- Stock Rotation in place

Handling

- Only used when cutting bands on wire spools
- Tin Snips only
- No Angle Grinder
- No burning equipment



Correct storage of steel wire



Prestart stressing equipment inspections and maintenance.



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- **What needs to be in place?**
- Records for work equipment should be available.
- Manufacturer's Instructions
- Maintenance log should be kept up to date
- Inspections. (Daily/ Weekly/6 monthly/12 monthly)

Well-maintained equipment is less likely to fail!

Equipment not inspected/maintained



Prestressing operation.

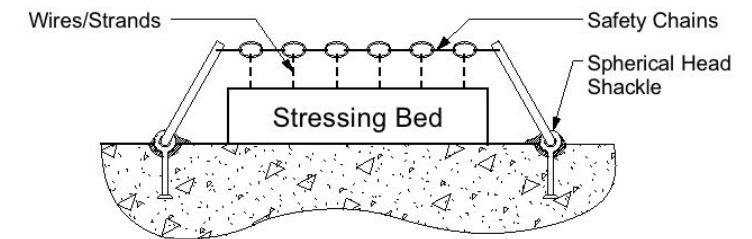
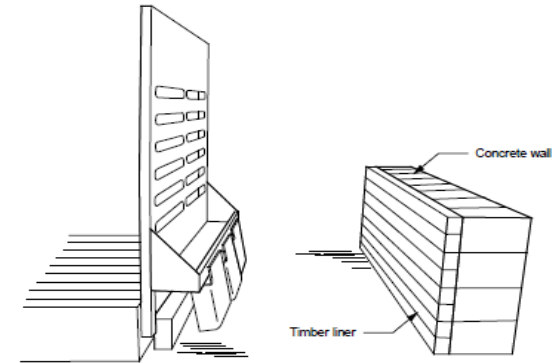
What needs to be in place during the prestressing operation?

- All personnel excluded from work area
- warning signs, audible/visual alarm



Layout of stressing area.

- timber liner
 - guarding of wires after stressing
 - protection of operator carrying out prestressing
 - Operator not in line with jack/wire
 - Intermediate saddles every ten metres and inspected before each use.
-
- **Permanent anchorage point.**
 - Inspection regime in place.
 - NDT tested every five years.



Destressing of concrete beds.

- Is done in a controlled and uncontrolled manner (Soft de-tensioning and shock destressing).
- Destressing needs to be risk assessed.
- Multi wire strand destressing.
- Single wire strand destressing. **Potentially more hazardous!**
- Operative needs to stand in a safe position so retracting wires will not strike them upon releasing stored energy.

Cleaning of barrels and wedges.

- **Cleaned, examined and lubricated after each use!**



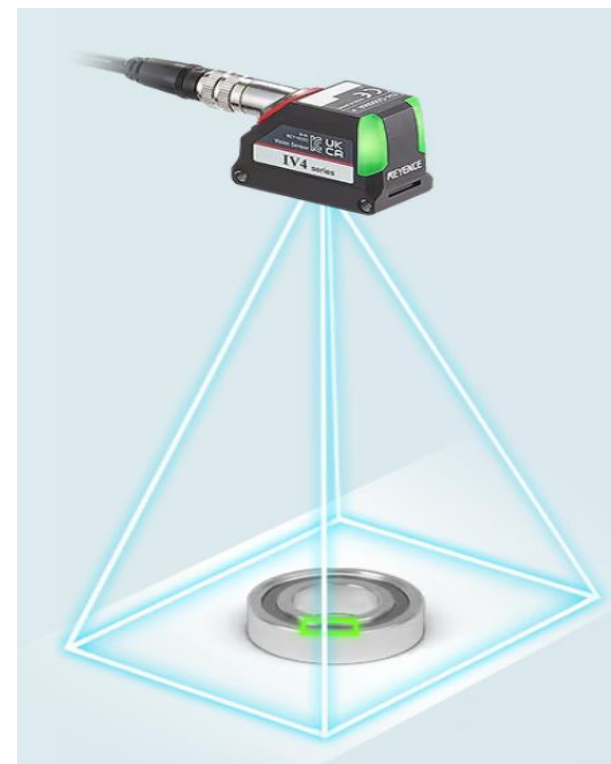
Inspection of barrels and wedges.

What is required?

- Correct cleaning equipment/brushes
- appointed individual
- aid of magnification
- spot checks carried out.

New technology to aid inspections.

- Vision systems with built in AI.



Good examples of Guarding.



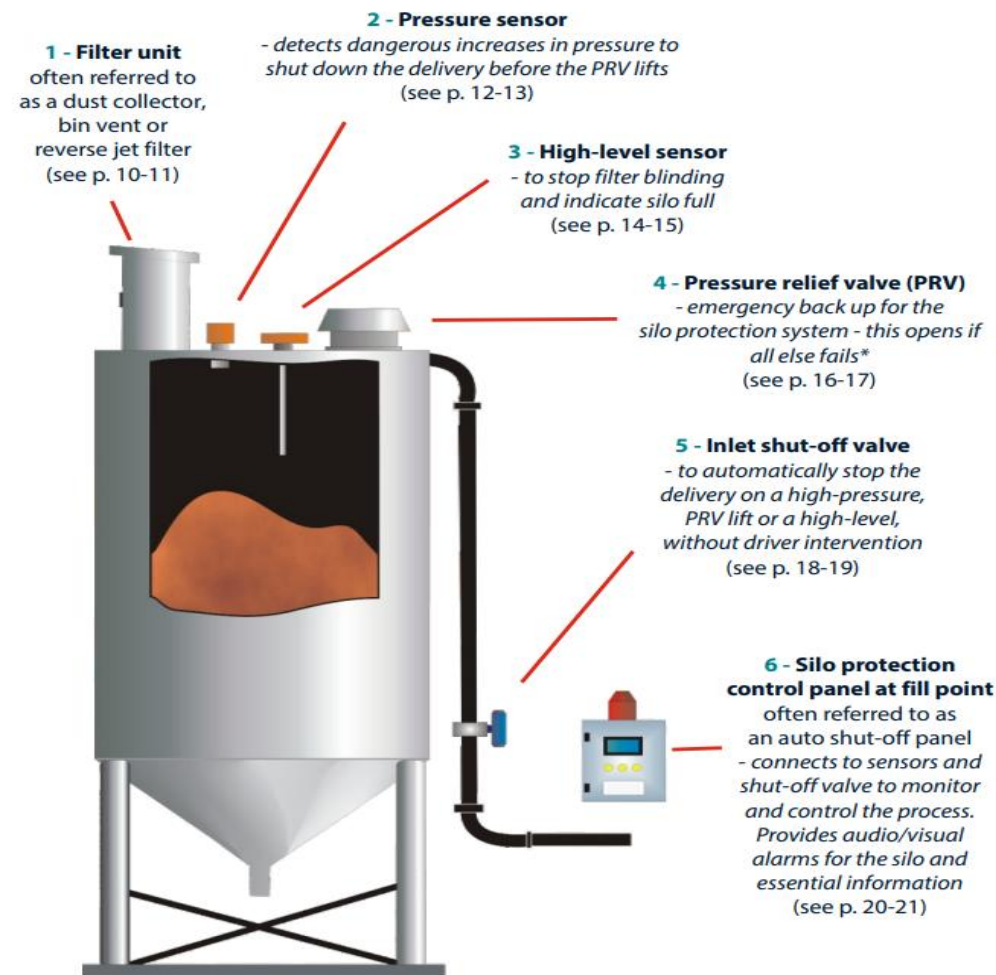
Precast Concrete

Precast concrete risk assessments

- **Occupational Safety.**
- All tasks to be risk assessed in the precast concrete processes.
- Risk assessments to include production tasks, maintenance tasks, and cleaning tasks.
- Ensure you factor into your risk assessment, bespoke mould assembly and disassembly and storage of moulds.
- **Occupational health.**
- Working in an environment with silica dust present.
- Working with chemicals in the workplace. (mould oil)
- Noise
- Welding fumes

Cement Silo deliveries

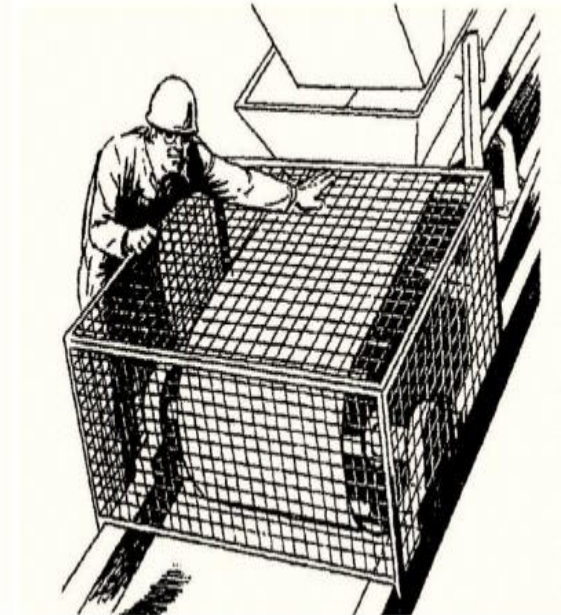
- Cement delivery process needs to be risk assessed.
- Cement silos need to be on a maintenance schedule.
- Recent safety alert on a cement tanker over pressurised.
- https://www.hsa.ie/eng/safety_alerts/2024/cement_tankers_safety_alert/



Cement tanker incident



Guarding and safety devices



Traffic management



Traffic management



Question set 2025- Prestress

	Question:	
1.	Has site specific risk assessments been carried out of the prestressing activities?	Yes/No
2.	Are there safe systems of work in place for prestress activities.	Yes/No
3.	Have all operatives involved in the prestressing process received sufficient training and are training records available?	Yes/No/partial
4.	Has the destressing process been risk assessed?	Yes/No
5.	Is the steel wire stored correctly and kept dry to prevent corrosion?	Yes/No
6.	Is the steel wire in a cage and is the correct tool used to release the wire? (tin snips)	Yes/No
7.	Are warning signs displayed and visual/audible alarms in place during stressing operations?	Yes/No
8.	Are all other operatives excluded from the work area prior to the stressing?	Yes/No
9.	Is the stressing operative provided with a safe location during stressing operation?	Yes/ No
10.	Is there timber protection in place to absorb the impact from a rebound of the wire strands in the event of an uncontrolled release?	Yes/No
11.	Are warning signs displayed and visual/audible alarms in place during stressing operations?	Yes/No

Question set 2025- Prestress

11.	Are warning signs displayed and visual/audible alarms in place during stressing operations?	Yes/No
12.	Are hydraulic jacks maintained and inspected (as per manufacturers recommendations) and have a valid calibration certificate?	Yes/No
13.	Does the pump have a working pressure release valve and is it working correctly?	Yes/No
14.	Are all barrels and wedges thoroughly cleaned, examined with the aid of good light and magnification and lubricated after each use.	Yes/No
15.	Are records maintained for the cleaning inspection and discarding of barrels and wedges?	Yes/No
16.	Are the permanent anchorage points NDT tested(every five years)?	Yes/No
17.	Are there intermediate saddles in place on prestress beds and are they inspected?	Yes/No
18.	Is the saw blade enclosed, and dust suppressed when cutting concrete?	Yes/No
19.	Is the correct PPE worn during prestress operations?	Yes/No
20.	Is the temperature of the curing beds set and monitored throughout the curing process? (applicable to sites with temperature-controlled curing beds)	Yes/No
21.	Are procedures in place for the safe transportation of prestress product on manufacturing site?	Yes/No

Question set 2025- Precast

Precast questions		
22.	Are there site-specific risk assessments in place for precast concrete activities.	Yes/No
23.	Have all operatives involved in the precast process received sufficient training and are training records available?	Yes/No
24.	Are there safe systems of work in place for the safe storage and assembly/disassembly of precast moulds (wall, lift shaft, cattle slats, bespoke moulds)	Yes/No
25.	Are there safe systems of work in place for the cutting, bending, welding and tying of rebar steel?	Yes/No
26.	Is there a maintenance schedule/records in place for the cement silo (pressure release valve, pressure sensors, high level sensors, control panel)?	Yes/No
27.	Have you a procedure in place for the delivery of cement on site?	Yes/No
28.	Is there a safe system of work in place for the pouring and stripping of concrete?	Yes/No
29.	Are all guards in place and safety devices checked and documented on all precast plant and equipment?	Yes/No
30.	Has all lifting equipment and lifting accessories, been identified and checked, and a lifting register in place?	Yes/No
31.	Is the correct PPE worn when oiling the moulds as per the safety data sheet?	Yes/No
32.	Is there a risk assessment in place for the cleaning of concrete mixer trucks?	Yes/No
33.	Has your risk assessment for traffic management on site been reviewed to identify blind spots? (Operatives walking past vehicle doorways)	Yes/No

Further information

British Precast Code of Practice for: THE SAFE STRESSING OF PRESTRESSED CONCRETE PRODUCTS



2014

Ver.18 GB 16 October 2014

LOAD SAFETY SERIES

Information Sheet

Safe Load Securing of Precast Concrete Loads

March 2016



What the Law requires

Under Health and Safety Legislation, a vehicle is a place of work. The law requires that workplaces are maintained in a condition that is safe and without risk to safety and health. Employers have duties under the Safety, Health and Welfare at Work Act 2005 to ensure, so far as is reasonably practicable, the health and safety of their employees and others who may be affected by their work activities (other road users). This includes providing systems of work that are planned, organised, performed, maintained and revised.

Road Traffic law requires

Every load carried by a vehicle in a public place shall be of such a weight and size and so distributed, packed, adjusted and attached to the vehicle that, so far as can reasonably be foreseen, no danger is liable to be caused and that there is no interference with the stability of vehicle. In the case of mechanically propelled vehicles and trailers, no load carried shall exceed a reasonable weight, having regard to the vehicles capability; brakes, tyres and general construction of the vehicle.¹

So, vehicle owners and operators need to ensure compliance with both health and safety and road traffic legislation if they are involved in loading, unloading or transporting loads of any type on their vehicles.

Pre-cast Concrete Loads

Precast Concrete products are high-risk loads and the consequences of load shift can be extremely serious. Loads that are not firmly anchored to the load bed may shift during transport. This can make them unsafe. Movement of the load endangers:

- The driver, if the load slides forward during the journey or shifts sideways and causes the driver to lose control of the vehicle.

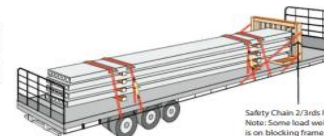
- Other road users including pedestrians, if the load shifts sideways or slides backwards and falls off the vehicle.
- Unloading personnel, if the load has become unstable during the journey and collapses during unloading.

Load Restraint Methods

Loads can be restrained by two basic methods, either indirectly or directly using 'Tie-down' or 'Direct restraint' methods respectively.

Tie-down is when the load is prevented from moving by friction only, also called a 'frictional lashing'.

Direct restraint is when the load is prevented from moving by containing, blocking or attaching it to the vehicle.



Safety Chain 2/3rds high
Note: Some load weight is on blocking frame

Figure 1. Example of correctly secured Precast Concrete load using chains

¹ S.I. No. 190/1963: ROAD TRAFFIC (CONSTRUCTION, EQUIPMENT AND USE OF VEHICLES) REGULATIONS, 1963, Reg 96



hseni
CONTROLLING RISK TOGETHER

Safety Precautions for Pre-stressing Operations

Introduction

It is important to consider the failure modes that may occur during the stressing operation. The strands of wire can be released due to the wire breaking at butt welds, at kinks in the wire, at damage points in the wire, failure of a double joiner, failure of wedges or barrels, failure of the anchorage points etc. The released wire moves at a very fast rate and can inflict serious or fatal injuries. When the steel wire anchorage fails the wire can shoot through the hydraulic jack into the protected area where the stressing operations are carried out. This may result in a direct hit on the stressing operator or depending on the lay-out the wire can ricochet off the back wall of the structure and hit the stressing operator.

Written **SAFE OPERATING PROCEDURES** for the stressing operation must be prepared and strictly implemented. Roles of individuals involved in the process should be defined in these procedures.

Only **trained and competent** personnel who are **authorised** should operate the stressing equipment. Review the training provided to all Operatives and ensure they are provided with appropriate personal protective equipment.

Precautions during stressing operations

Personnel not directly involved in the stressing operation must be excluded from the work area. Warning signs and an audible and visual (flashing light) alarm will alert personnel that stressing is taking place. No one should be working on the beds during stressing or on adjacent beds – everyone must be behind a guard or in another safe location.

The stressing operator must adopt a system of work that ensures they are never directly behind the hydraulic jack.

Operators must be provided with written instructions detailing the size of the strand and the appropriate stressing force or tension to be used for the strand. The instructions may also include the equivalent reading on the pressure gauge of the pump unit. This information should be recorded and records maintained.

Review the layout of the stressing area

Carry out a review of the stressing area to ensure that all the failure modes are considered and protection provided. This exercise may require modifications to be carried out such as providing a timber liner to capture any wires that travel through the hydraulic jacks. When the stressing operation is complete the wires at the stressing end must be guarded.

It is recommended that spring loaded grips are used at the anchorage end of the stressing bed.

This Information Sheet is to compliment Guidance GS 49 from HSE titled - Pre-stressed concrete
Date: 08th February 2013

Questions



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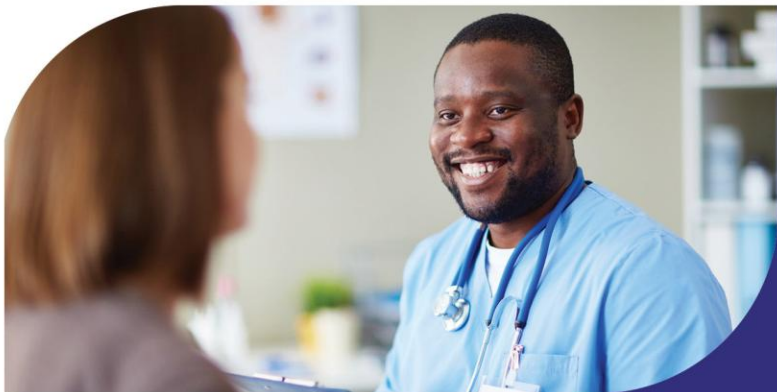




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Go raibh maith agaibh
Thank you



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