



SUMMARY OF PRODUCT CHARACTERISTICS

1. NAME OF THE MEDICINAL PRODUCT

Fyton 15 mg powder for injection

2. QUALITATIVE AND QUANTITATIVE COMPOSITION

Component	Quantity per vial	Function
Active substance		
Sodium-phytate	15.0 mg	Organ-specific chelating agent of ^{99m} Tc radioisotope

Component	Quantity per vial	Function
Active substance		
^{99m} Tc-Fyton	0.8–1.6 GBq	Organ-specific diagnostic information

For a full list of excipients, see section 6.1.

3. PHARMACEUTICAL FORM

Pharmaceutical form of Fyton kit: powder for injection
Pharmaceutical form of ^{99m}Tc-Fyton: injection

^{99m}Tc-Fyton injection can be prepared in situ at the site of the use ie. at isotope laboratories of clinics or hospitals by mixing Fyton powder for injection (lyophilisate in the vial) and [^{99m}Tc]pertechnetate eluate. Sterile, pyrogen free solution of [^{99m}Tc]pertechnetate can be obtained by using ⁹⁹Mo/^{99m}Tc generator.

4. CLINICAL PARTICULARS

4.1 Therapeutic indications

This medicinal product is for diagnostic use only.
INDICATION FIELD: ISOTOPE DIAGNOSTICS
-Morphological examination of the liver by imaging technique
-Diagnosis of benign and malignant liver tumours and monitoring of the therapy

4.2 Posology and method of administration

Posology
74–185 MBq ^{99m}Tc-Fyton for intravenous administration. For 70 kg of bodyweight 120 MBq is advised.

Method of administration

^{99m}Tc-Fyton obtained in one labelling reaction can be divided to 3 – 6 doses. Label content of one vial of Fyton kit by using 0.8 – 1.6 GBq of [^{99m}Tc]pertechnetate activity.

^{99m}Tc-pertechnetate activity for labelling must be chosen so that individual patient dose should be 74 – 185 MBq at the time of the investigation.

For paediatric examination use Webster's equation to determine the activity to be administered and see Chapter 4.3.

$$A_{\text{child}} = [(N+1)A_{\text{adult}}] / (N+7)$$

where N = age of the child [year]

$$A_{\text{child}} \cdot A_{\text{adult}}$$

activity [MBq]

Method of examination

Gamma camera images of the liver –spleen tract can be taken 20 minutes after administration. In case of patients suffering in liver cirrhosis 30 minutes are required.

4.3 Contraindications

- Hypersensitivity to the active substance or to any of the excipients
- Pregnancy and lactation
- Under 18 years of age except if the necessity and importance of obtaining the diagnostic information outweighs the risk associated with the radiation exposure

4.4 Special warnings and precautions for use

Patient exposure must be minimised, i.e. the possible lowest activity should be used for the examination to obtain the diagnostic results. Radioactive medicinal products should be received, used and administered only by authorised person in designated clinical settings. Receipt, storage, use, transfer and disposal of the radioactive medicinal products are subject to the regulations and appropriate licences of the competent authorities.

4.5 Interaction with other medicinal products and other forms of interaction

No drug-drug interactions have been described to date.

4.6 Pregnancy and lactation

Use of the product is contraindicated in case of pregnancy and lactation.

There are no information on the secretion of ^{99m}Tc-phytate in breast milk. Therefore, use of the product is contraindicated in case of breast feeding mother.

4.7 Effects on ability to drive and use machines

The product has not direct influence on ability to drive and use machines.

In occurrence of unexpected adverse reactions driving and/or working with machines should be reconsidered.

4.8 Undesirable effects

Exposure to ionising radiation is linked with cancer induction and a potential for development of hereditary defects. However these effects are hardly expected regarding the applied amount of activity.

Adverse event and reactions have not been reported ever since the authorization of the product (1977) nor registered in the literature. Considering the number of the examinations carried out since, no adverse reactions are expected (frequency lower than 1/10000).

The effective dose remains below 20 mSv even in case of the maximal advised dose.

4.9 Overdose

No case of overdose has been reported.

Administration of higher activities than prescribed is unnecessary and must be avoided in order to avoid the excess absorbed radiation dose of the patient and his/her environment.

In case of incidental overdose, the effectively administered activity of ^{99m}Tc must be determined (in MBq) and the actual absorbed radiation dose must be calculated by using the data of the dosimetric table of

Chapter 11. Necessity and method of further treatment should be

concluded based on these results.

The table of Chapter 11 contains absorbed radiation dose data in µGy in case of intravenous administration of 1 MBq of ^{99m}Tc-Fyton.

Multiply these specific absorbed radiation dose data by the effectively administered activity (in MBq) to obtain the required absorbed radiation dose data in µGy.

Quantity of Fyton introduced to one patient is not less than 2.5 mg and not more than 5.0 mg if administration is complying with the recommendations. If the whole content of the vial containing the labelled substance is administered to one patient by mistake 15.0 mg of Fyton is introduced in the body.

Acute toxicity studies on rats showed that there are not any clinical symptom, if less than 4 mg/kg of bodyweight is administered. If the whole content of the vial containing the labelled substance is administered to one patient by mistake, it represents 0.21 mg/kg of bodyweight level (calculated on 70 kg average bodyweight). This is equivalent to 5.25 % of the no observed effect level. Thus, no toxic effects are expected in case of overdose.

5. PHARMACOLOGICAL PROPERTIES

5.1 Pharmacodynamic properties

Pharmacotherapeutic group: Radiopharmaceuticals
ATC code: V09D B 07

After administered intravenously ^{99m}Tc-phytate forms a microdisperse system (colloid) with calcium ions of the blood. The cells of the liver and the spleen, the Kupffer-cells and the reticuloendothelial system extract that system from the blood (phagocytosis). 90-95% of the activity appears in the liver. Further 5-10% is deposited in the spleen and the bone marrow. The colloid leaves the liver in the way of slow degradation and hydrolysis of the micro-particles. In case of impaired liver function the bone marrow radioactivity is increased and some activity appears in the lungs. However, diffuse liver diseases result in an increased spleen activity.

5.2 Pharmacokinetic properties

^{99m}Tc-phytate introduced intravenously leaves the bloodstream in two parallel processes described by two exponential curves:

$$\text{Fast process } T_{1/2} = 2.4\text{-}7 \text{ min}$$

$$\text{Slow process } T_{1/2} = 69\text{-}105 \text{ min}$$

The fast process is the result of the operation of the reticulo-endothelial system.

The liver uptake is quick, it can be observed even some minutes after administration. After thirty minutes 90% of the radioactivity is accumulated in the liver. However, excretion from the liver is extremely slow.

5.3 Preclinical safety data

Acute toxicity study of rats showed no clinical symptoms up to 4 mg/kg of body weight. Quantity of the administered ^{99m}Tc-Fyton, if complying with the recommendations, is not less than 2.5 mg and not more than 5.0 mg. Calculated on an average 70 kg of bodyweight the smallest and the greatest quantities are equivalent to 0.9 and 1.8 % of the no observed effect level, respectively. Thus, the use of the product considered safe.

Further advantage of the product is that the activity of [^{99m}Tc]pertechnetate in the range of 0.8 –1.6 GBq does not affect the radiochemical purity of the preparation. Quantity of radiochemical impurities is always less than 10 %, therefore the kit is safe from the point of view of labelling.

6. PHARMACEUTICAL PARTICULARS

6.1 List of excipients

Component	Quantity per vial	Function
Excipients		
Stannous chloride dihydrate	1.0 mg	Reducing agent of [^{99m} Tc]pertechnetate
Sodium-chloride	10.0 mg	Filler

6.2 Incompatibilities

One component of Fyton kit is stannous chloride, which is a reducing agent. It reduces free pertechnetate, which (+7 oxidation state) to +4 oxidation state, in which technetium readily forms complex with Fyton. It is important to keep away the content of the vials from moisture and oxidising agents, e.g. chemical oxidation agents or oxygen of the air. Alkaline media facilitate the oxidation of Sn (II) before the labelling reaction this is why the product is incompatible with bases.

As a result of these incompatibilities it is recommended to remove the closure of the closed injection vials just before the labelling reaction. Perform the labelling by observing the instructions of Chapter 12.

6.3 Shelf life

Shelf life of Fyton kit (lyophilised, non-radioactive components in injection vials closed with rubber stopper and aluminium kombicap) is 12 month from the date of the manufacture.

One paper box contains 6 of injection vials, which can be labelled at different times within the expiry time.

^{99m}Tc-labelled Fyton must be used within 3 hours.

6.4 Special precautions for storage

Do not store Fyton kit above 25°C.

Do not store ^{99m}Tc-Fyton injection above 25°C. Comply with the regulations for radiation safety.

6.5 Nature and contents of container

The injection vials of Fyton kit contain the sterile, pyrogen-free and freeze-dried components. The labelled 6 ml injection vials are closed with rubber stopper and tear-off aluminium kombicap. The labelled vials are supplied in a white, 150 x 100 x 60 mm carton box. Position of the vials inside the box is fixed by a carton insert, which prevents the moving of the vials. One box contains six vials, one Summary Of Product Characteristic and Patient Information Leaflet and six labels with radioactive material sign.

6.6 Special precautions for disposal and other handling

Any unused product or waste material should be disposed of in accordance with local requirements.

7. MARKETING AUTHORISATION HOLDER

Institute Of Isotopes Co. Ltd.

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8. MARKETING AUTHORISATION NUMBER(S)

OGYI-T-9288/01

9. DATE OF FIRST AUTHORISATION/RENEWAL OF THE AUTHORISATION

21 December 1977 / 18 December 2009

10. DATE OF REVISION OF THE TEXT

18 December 2009

This SPC was translated by the manufacturer based on the original Hungarian document, authorized by the Hungarian National Institute of Pharmacy on 18.12.2009.

11. DOSIMETRY

Individual patient dose is 74 – 185 MBq. Estimated absorbed dose values of 1 MBq of the injection for an average body weight of 70 kg are given in the table below.

Organ	Absorbed dose [µGy / MBq]
Liver	92
Spleen (at spleen scintigraphy)	57
Bone marrow	7.3
Testes	0.3
Ovaries	1.5

Radiation physical properties

Physical half-life

Energy and intensity of the
emitted gamma photons

Energy and intensity of the
emitted beta particles

6 hours

140 keV

100 %

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Mobile phase: Acetone, 10 % CaCl₂ solution. Temperature: Room

temperature: 20-25°C.

Fresh prepared ^{99m}Tc-Fyton injection is tested by two chromatographic processes:

-Determination of free ^{99m}TcO₄⁻ by paper chromatography

Use 3 pieces of 1.5 x 20 cm ET-31 paper strips. Apply to the strips 5 – 5 µl (approximately 1 MBq/ µl) of the solution to be tested at 1.5 cm from the end of the paper. Develop the strips over a 15 cm path in acetone. Evaluation: Dry the strips and impregnate them with 5% polystyrene solution. Determine the radioactivity by using a scanner. Radiochemical purity is calculated by using the data of three replicates.

Information on Rf values: ^{99m}Tc-Fyton complex: 0–0.3, Free ^{99m}TcO₄⁻ 0.8–1

-Examination of the disperse system formed with Ca⁺⁺ ions by paper chromatography

Use 3 pieces of 1.5 x 20 cm ET-31 paper strips. Apply to the strips 5 – 5 µl of the solution to be tested at 1.5 cm from the end of the paper. Develop the strips over a 15 cm path in 10% CaCl₂. Dry the strips and impregnate them with 5% polystyrene solution. Determine the radioactivity by using a scanner. Radiochemical purity is calculated by using the data of three replicates.

Information on Rf values:

^{99m}Tc-phytate and Ca disperse system 0.3–0.4

Free ^{99m}TcO₄⁻ 0.7–1.0

Radiochemical purity is calculated by using the peak areas. Total activity of the strip is considered 100% and activity percentage due to ^{99m}Tc-Fyton peak is the radiochemical purity, which is not less than 90% at expiry date.

Any unused product or waste material should be disposed of in accordance with local requirements.



PACKAGE LEAFLET: INFORMATION FOR THE USER

Fyton 15 mg powder for injection

Sodium phytate

Read all of this leaflet carefully before this medicine is used for your examination.

- Keep this leaflet. You may need to read it again.
- If you have any further questions, ask your doctor.
- If any of the side effects gets serious, or if you notice any side effects not listed in this leaflet, please tell your doctor.

In this leaflet:

1. What Fyton is and what it is used for
2. Before you use Fyton
3. How to use Fyton
4. Possible side effects
5. How to store Fyton
6. Further information

1. WHAT FYTON IS AND WHAT IT IS USED FOR

This medicine is for diagnostic use only.

^{99m}Tc-Fyton injection prepared from Fyton kit is a sterile solution that contains radioactive isotope. Use of Fyton is permitted only in departments of nuclear medicines.

^{99m}Tc-Fyton injection is administered intravenously. After intravenous administration, ^{99m}Tc-Fyton is transported to the liver via the blood circulation. As the medicine contains gamma-radiator radioactive isotope, it can be detected from outside the body using gamma cameras. The pictures taken by this camera show the distribution of the radioactive isotope in your body and organs. The pictures can give your doctor valuable information about the structure and working of the organ helping this way to choose the best treatment.

^{99m}Tc-Fyton is suitable for morphological examination of the liver, diagnosis of benign and malignant liver tumours and monitoring of the therapy

2. BEFORE YOU USE FYTON

Do not use Fyton

- if you are allergic (hypersensitive) to the active substance or any of the other ingredients of Fyton.
- If you are pregnant or breast feeding, except if your doctor decides otherwise
- If you are under 18 years of age, except if your doctor decides otherwise

Make sure you carry out the doctor's instructions both before and after the examination in order to avoid radioactive exposure of other people and the radioactive contamination of the environment.

The radioactive isotope is excreted in the urine, faeces, sweat and other secretions temporarily contaminating the environment this way.

Using other medicines

Please tell your doctor if you are taking or have recently taken any other medicines, including medicines obtained without a prescription.

Using Fyton with food and drink

You can take Fyton with any food or drink.

Pregnancy and breast-feeding

It is important to tell your doctor if there is any possibility that you are pregnant or if you breast-feed.

In these cases your doctor will consider the necessity of the radioisotope diagnostics. The radioisotope can be dangerous to the foetus and the infant, and it is excreted in mother's milk. Therefore, it is possible that your doctor will choose other, non-radioactive method. Trust your doctor, because the decision will be made in accordance with strict regulations.

If you are breast-feeding and you will be examined with this product, you should stop breast-feeding for the period recommended by your doctor.

During this time the radioactive isotope will be eliminated from your body. Use formula feed for your child. The breast milk should be expressed and collected and spilled out after dilution. You can restart breast-feeding when the radiation dose for the child is less than 1 mSv. Your doctor will decide about the restart of breast -feeding.

Driving and using machines

^{99m}Tc-Fyton has no influence on the ability to drive and use machines.

Important information about some of the ingredients of Fyton

When you are given ^{99m}Tc-Fyton you receive a small amount of radiation. The adsorbed dose in this case is usually smaller than those of certain X-ray examinations (e.g. CT). Your doctor will always consider the possible risks and advantages.

If you have any further questions on the use of this medicine, ask your doctor.

3. HOW TO USE FYTON

^{99m}Tc-Fyton injection is prepared by mixing the content Fyton kit and radioactive ^{99m}Tc-pertechnate at the site of the use (hospitals, clinics). The injection is administered intravenously.

Amount of the administered activity, method and timing of imaging is decided by your doctor according to the type of examination and your state of health.

What should you do if you received overdose of the medicinal product?

There are strict rules and regulations on handling, use and disposal of radioactive materials. Therefore, ^{99m}Tc-Fyton can only be used in hospitals or institutes.

Fyton can be handled, used and administered only by people specialized for handling of radioactive materials and waste. These people give you instructions about the precautions and warnings. Comply with their instructions.

Since ^{99m}Tc-Fyton is given by a doctor under controlled conditions, the probability of overdose is low. In the unlikely event of overdose your doctor

will advise you to drink lots of liquid and eat lots of high-fiber foods which will accelerate the elimination of the drug from your body. You should take all necessary precautions against the contamination of your environment with radioactivity. Comply with the instructions given by your doctor.

^{99m}Tc-Fyton which is temporarily present in your body and the excreted material lose their radioactivity in a natural way.

If you have any further questions on the use of this medicine, ask your doctor.

4. POSSIBLE SIDE EFFECTS

Exposure to ionising radiation is linked with cancer induction and a potential for development of hereditary defects. However these effects are hardly expected regarding the applied amount of activity.

Adverse event and reactions have not been reported ever since the authorization of the product (1977). Considering the number of the examinations carried out since, no adverse reactions are expected.

The amount of radioactivity in the body from ^{99m}Tc-Fyton is small. It will be passed out of the body in a few days without any intervention. If you have any further questions on the use of this medicine, ask your doctor.

5. HOW TO STORE FYTON

Keep out of the reach and sight of children and people who are not authorized to handle, use or transport this product!

Hospital staff will ensure that the product is stored correctly and not used after expiry date stated on the label.

Fyton powder for injection should not be stored above 25°C.

Radioactive ^{99m}Tc-Fyton is to be stored below 25°C, considering the regulations for radiation safety.

^{99m}Tc-labelled Fyton must be used within 3 hours.

Expiry and storage conditions are indicated on the labels.

6. FURTHER INFORMATION

What Fyton contains

- The active substance is 15 mg sodium phytate per vial

- Other ingredients are: Stannous chloride dihydrate, sodium chloride

- The active substance of the labelled, radioactive Fyton: ^{99m}Tc-Fyton

What Fyton looks like and contents of the pack

The injection vials (6 ml) containing the sterile, pyrogen-free freeze-dried product are closed with rubber stopper and tear-off komicap (aluminium and plastic).

Six vials of Fyton kit are packed into one paper box, with six label with radioactive symbol.

Marketing Authorisation Holder and Manufacturer

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