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Oncology therapy at home

Useful tips

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If you are reading this booklet it is because your oncologist has prescribed you an **oral anticancer treatment** that must be taken at home.

This new way of **drug intake at home** is certainly convenient, however it is extremely at risk of efficacy in case the patient does not take the drug regularly or takes it incorrectly or if he combines other drugs or supplements without notifying his oncologist.

In fact each drug prescribed, as well as being specific for each patient, must be taken **following the instructions given by the doctor and/or pharmacist**, if you want to have the desired effect. The prescription must be perfectly understood since, if the drug is used incorrectly, its effects can be unnecessary or even dangerous, especially when it comes to anticancer drugs. Furthermore it must be considered that the effect of the drug can be altered in relation to the intake of food, other drugs or supplements and therefore it is always necessary to discuss with the oncologist before inserting any other pharmaceutical or homeopathic product into the treatment.

The anticancer drugs that are taken at home can be **chemotherapy or anticancer molecules directed against special targets**. Whatever type of drugs you will have to take, even with the specificities of the single product, there are basic rules that it is better to know.

Tips for following and adhering to the prescribed treatment:

- ❖ Inform your doctor of all therapies you are taking, including over-the-counter drugs.
- ❖ Make sure you have correctly understood the modality and timing of the drug intake, even repeating them to the oncologist and/or pharmacist and/or nurse.
- ❖ Check that the therapy is always clearly written in the discharge letter indicating the quantity to be taken, when and for how long.
- ❖ Take the drug according to the intake way and as indicated (interval between one intake and the next, intake time, proximity to meals, etc.).
- ❖ In case of non-intake, report it to the oncologist.
- ❖ Do not interrupt therapy without the oncologist's advice except in the event of important side effects.
- ❖ Report to the doctor the appearance of any side effect, indicating extent and frequency. Side effects that were not reported by the oncologist at the time of prescription should also be reported.
- ❖ In case of doubt ask your doctor, pharmacist or nurse any clarification.

What can be done to be sure to take the prescribed anticancer drugs adequately?

1. Write on the package how to take the medication, when to take it and for how long to take it.
2. On a diary write the name of the drug, how to take it, when to end it and report any effect related to the intake day by day in order to be able to report the exact situation to the oncologist during check-ups.
3. Write the therapy to be taken on a chart, integrating it with the usual therapies.
4. Always keep any drugs prescribed to take care of side effects, indicating on each package what they are used for (eg for diarrhea, constipation, etc.) and specifying when and how to take them.

What is meant by interactions?

The therapeutic efficacy of a drug, be it anticancer or not, may be different from the desired one, as it may interact with another drug you are taking (drug-drug interaction), but also with food or drink (drug-food interaction), food supplements, phytotherapeutic, vegetable and homeopathic products.

The interaction of drug-drug, drug-food, drug-other products can determine a variation of the therapeutic activity which can manifest itself either through an enhancement of its activity, a decrease in its effectiveness or even a harmful collateral event.

These interactions can be caused as a result of accidental abuse or lack of knowledge of the active ingredients present in drugs, food or supplements. Significant clinical interactions that represent a potential damage for the patient, may result in changes in the pharmacokinetic properties (assimilation, distribution, metabolism and elimination of the drug) or pharmacodynamics (effects of the drug on the organism). These interactions often lead to serious adverse events for the patient.

The only way to prevent these interactions is to inform the oncologist/doctor who is prescribing all the drugs you are already taking, including over-the-counter drugs. In fact, the simultaneous intake of several drugs/supplements/phytotherapeutic/homeopathic drugs may require the temporary interruption of a product or its substitution or the adjustment of the dose.

Interactions of drug-drug: some examples

- **Drug-kinetics interactions:** the drugs involved in the interaction can cause a reduction in absorption (by alteration of gastric pH, by the formation of complexes that slow down absorption, by increasing gastric motility, by

stimulation or inhibition of hepatic metabolism). For example: ketoconazole, an antifungal drug, requires an acid pH for the absorption and therefore cannot be intaken in combination with antiacid drugs, anticholinergics or proton pump inhibitors such as omeprazole. If necessary, these drugs should be taken hours away from ketoconazole.
Some antibiotics such as tetracyclines combine with metal ions such as calcium, magnesium, iron forming complexes that reduce the absorption of the drug. Metoclopramide, an antinausea drug, by stimulating gastrointestinal motility can reduce the absorption of drugs.

- **Drug-dynamics interactions:** the drugs involved in the interactions can have opposite or additive effects thus determining either a reduction in efficacy or an increase in toxicity. For example, the risk of gastric bleeding in patients who take warfarin (anticoagulant drug) is increased by the simultaneous intake of drugs that can cause bleeding with different mechanisms such as acetylsalicylic acid (active ingredient of aspirin and other related drugs).

Drug-food interactions: some examples

Foods and drinks can interfere with the absorption, metabolism, bioavailability and elimination of the drug making it ineffective or enhancing its toxicity. The patient who is taking a drug should carefully follow the instructions given by the doctor and/or pharmacist and the warnings contained in the package leaflet.

It will therefore be possible that the drug should be taken on an empty stomach (one hour before or two hours after eating) or on a full stomach (during or after a meal), away from certain foods or excluding some foods and drinks for some time.

Absorption: foods particularly rich in fat slow down gastric emptying of certain drugs such as antihistamines. Milk and some of its derivatives cause premature dissolution of acid resistant tablets causing an alteration of their absorption and gastric inflammation. Moreover, milk, due to its high calcium content, can interact with some antibiotics such as fluoroquinolones (ciprofloxacin, norfloxacin) reducing their effectiveness, therefore it is better to take these drugs away from breakfast if it is based on milk or its derivatives. Fruit or vegetable juices and drinks containing caffeine can also alter the absorption of drugs.

Some advices: swallow tablets or capsules with at least half a glass of water, do not mix the drug in food, do not open the capsules but take them whole, do not take the drugs together with alcoholic drinks, do not mix the drug with hot drinks.

Distribution: many factors can influence the distribution of the drug in the body. Advanced age is for example associated with a decrease of water in the body, an increase in fat deposits and a reduction in plasma proteins, all factors that can interfere with the distribution of the drug.

Metabolism: liver and intestine are responsible for detoxifying the body through the action of enzymes that transform lipophilic and hydrophilic substances favoring their elimination (cytochrome P450, cytochrome 3A4). Moreover there are molecules, such as the P-glycoprotein which is responsible for transporting drugs from the intestines to the blood (it carries a lot of drugs including many chemotherapy ones).

Some examples: grapefruit juice can inhibit cytochrome 3A4 causing a significant increase in plasma concentration of some drugs including amiodarone, felodipine, nifedipine, atorvastatin, cyclosporine and many anticancer drugs (crizotinib, cyclophosphamide, erlotinib, imatinib, lapatinib, pazopanib, rorafenib, sunitinib, vunurafenib, everolimus).

Complementary medicine-drug interactions: some examples

Medicines can also interact with **complementary medicaments** even if it is very complex to recognize these interferences due to the extreme variety of products on the market, the variability of their composition also based on geographical origin, harvesting procedures and plant contamination. Moreover, the pharmacological activity of a medicine or a phytocomplex can be modified by differences in genetic polymorphism, age, gender, state, the composition of the intestinal bacterial flora and the pharmacological dosage.

Complementary treatments are distinguished in:

- **Phytotherapy:** this is the discipline that is based on the use of medicinal herbs and derivatives for preventive, curative purposes or for the maintenance of psychophysical well-being. A plant is defined as a medicinal one when it contains in one or more parts (leaf, roots, buds, etc.) one or more substances which can be used for therapeutic or preventive purposes or which are precursors of substances also used in pharmaceuticals. Many of the drugs that are used in therapy derive from vegetable substances or have been developed from them. Some examples: acetylsalicylic acid, vincristine, vinblastine, vinorelbine, irinotecan, topotecan, etoposide, taxol, digoxin, morphine, etc.

  In addition to phytotherapics there are also herbal products, which are

formulations based on plants not added with synthetic products and therefore definable natural. They are freely sold and are indicated as having healthy effects or adjuvants to the normal dynamics of the organism. However, such preparations cannot boast therapeutic properties. However, it is important to pay attention to these products too, since they can cause side effects, allergic reactions and interactions with other medicines and foods.

- **Homeopathy:** it is a therapeutic practice based on the principles enunciated by the German doctor Samuel Hahnemann in the eighteenth century. At the base there is the unproven "principle of similarity of the drug " (similia similibus curantur) enunciated by Hahnemann himself. It is a concept without scientific basis, according to which the appropriate remedy for a certain disease would be given by that substance which, in a healthy person, induces symptoms similar to those observed in the sick person. This substance, also called "homeopathic principle ", once identified is given to the patient in a highly diluted quantity; the extent of dilution is defined by homeopaths as "power". These medicines have no therapeutic indications approved by regulatory bodies. In the oncological field, homeopathy can be used as a treatment to control side effects or at the end of the treatment to speed up physiological recovery. Some useful remedies: ipecac for nausea and vomiting, mountain arnica for vascular congestion caused by repeated intake of intravenous drugs, magnesium for anxiety states, muscle cramps.

  Complementary medicine products are not necessarily safe, their intake is not without side effects. Furthermore they can interfere with anticancer therapies.

It has been shown that some phytotherapeutic drugs interfere with anticancer drugs through their action on the cytochromes responsible for their metabolism.

St. John's grass (hypericum perforated: drug used for mild depression) is an inducer of liver enzymes and can reduce blood concentration of many drugs such as digoxin, lovastatin, sildenafil but also of chemotherapy drugs such as irinotecan, imatinib and docetaxel.

Garlic (used as an antihypertensive, antibacterial and antiparasitic) interferes with anticoagulants but also with chemotherapeutics and should therefore be used with caution.

Ginko Biloba (used in Alzheimer's disease or Claudicatiointermittens) should be avoided with chemotherapeutic agents such as cyclophosphamide, inhibitors of receptor Epidermal Growth Factor Receptor Tyrosyn Kinase (EGFR-TK), epipodophyllotoxins,

taxanes, vinca alkalodes. Not recommended with alkylating agents, anticancer antibiotics, platinum analogs. It also interacts with anticoagulants and platelet aggregation inhibitors.

Vitamin E enhances the activity of anticoagulants such as warfarin by increasing the risk of bleeding.

Homeopathic medicines are considered safe as they are used at the lowest dose, they do not reduce immune defenses, they do not cause allergy or other damage. However it is always better to inform the oncologist if these products are taken.

What do we do in our Center?

1. When an oral anticancer treatment is proposed, it is explained orally by the oncologist which drug to take, how, its side effects and how to manage them.
2. Treatment indication is written in the discharge letter where you can find as a reminder what the oncologist said verbally.
3. In the discharge letter are also written the drugs to be taken in case of side effects (the most frequent and predictable ones) specifying how to use them.
4. A prescription is made to withdraw the drug at the Hospital Pharmacy.
5. A form is given with indications on the intake method and possible interactions, with a section dedicated to the treating doctor.
6. A home diary will be given to you, on it you will record if you have taken the drug, to monitor its side effects. At each check-up visit you will have to bring this diary to your oncologist.
7. Check-up exams and visits are required to verify adherence to therapy and side effects to handle.

   The patient must follow the directions, ask for additional information in case of doubts, report any adverse event especially if not reported by the prescriber, handle predictable side effects with the support drugs indicated and in the given modalities and report about any new therapy added by any other doctor.

Piedmont and Valle d'Aosta's Oncology Network
"YOU AT THE CENTER AND WE BY YOUR SIDE"

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