Thyroid cancer clinical pathway
This leaflet was written to properly inform patients undergoing thyroid cancer treatment. The leaflet doesn’t replace the dialogue with healthcare staff; it rather represents a suggestion to raise questions and requests.

**What is Percorso Diagnostico Terapeutico Assistenziale (PDTA)**

Dealing with a health problem often requires the support by different health professionals, working together to fix up pathways which clearly differ in ways, times and methods, as far as diagnosis, treatment and patient healthcare are concerned. Beginning from diagnosis up to therapy, through every healthcare step, there is a defined pathway and each patient follows it together with health professionals dealing with his case; in Italy, we call it Percorso Diagnostico Terapeutico Assistenziale (PDTA).

In PDTA, emphasis is put on patient and hospital units are equipped in order to ensure everyone standardised and equal treatments, from diagnosis to home care.

Taking into account scientific knowhow and available technologies, each clinical pathway is defined in detail by all professionals (physicians, nurses, technicians etc.) taking care of each patient in the different steps of clinical pathway.

Santa Maria Nuova Hospital set up clinical pathways for oncological pathologies ensuring that each patient is taken care by a specialist physician, who will support him from diagnosis to treatment and the following checkups.

Different professionals, who are involved in clinical pathways, meet regularly (*weekly or fortnightly*) to exchange opinions on patients’ cases and make the best choices, as far as patient treatment and care are concerned.
**Thyroid cancer**

The thyroid is a gland found at the base of neck, opposite trachea. It resembles the shape of a butterfly, with two parts called “lobes” connected by a narrow string of tissue string called “isthmus”. Thyroid produces hormones called thyroxine (T4) and triiodothyronine (T3).

A good thyroid functioning is necessary to develop and keep normal physical and intellectual condition.

In Europe, from 15 to 20 women and from 5 to 10 men out of 100,000 get thyroid cancer, every year. This means that in Reggio Emilia Province 100-150 new cases of thyroid cancer are expected each year.

The number of patients affected by thyroid cancer is increasing and this is due mostly to increased health surveillance. Many thyroid tumors have small size and are slightly aggressive; they are detected by chance, while performing other clinical investigations, and this didn’t commonly happen in the past.

For this type of cancer, there are very effective treatments, nowaday.

The course of disease may depend on:

- stage of detected tumor;
- local invasivity;
- tumor’s size;
- presence of distant metastases;
- age at diagnosis (*survival is higher among younger patients*),
- sex (*survival is higher among women*).

In case of thyroid cancer, a clinical pathway (PDTA) was set up in order to take care of patient from diagnosis to surgical intervention and later for further therapies and checkups. This pathway, which envisages the participation of different health professionals, involves Units such as Pathology, Thoracic surgery, Endocrinology, Nuclear Medicine, Otolaryngology and moreover Laboratory of Molecular biology, Oncology, Radiology and Radiation Therapy.

**Diagnosis, classification and treatment of thyroid nodule**

Almost always thyroid cancer diagnosis occurs when a thyroid nodule is detected.

Nodule detection may happen because a nodule is identified by touch, or there is a neck swelling, or, as mentioned before, nodule can be detected while performing other clinical investigations. The examination which analyses the nodule is thyroid ultrasound. It allows to evaluate the number, seat and characteristics of nodule or nodules.

When ultrasound detects a doubtful nodule or one of a certain size, it might be necessary to undergo a fine needle aspiration (FNA). This examination is usually performed by Endocrinologist and means aspiration of small quantities of cells from the nodule by employing a fine needle. It allows to determine the nature of nodule itself. As a matter of fact, aspirated cells (*so called cytological sample*) are analyzed under microscope, with the aim of distinguishing between benign and malignant nodules.

This procedure shows some disadvantages, mainly because fine needle aspiration takes only groups of cells (*cytologic exam*), and not nodule tissue (*as it happens with hystological examination*). For this reason, FNA result might not be clearly classified as “benign” or “malignant”.

There are many classifications in thyroid cytology: at Arcispedale S. Maria Nuova – IRCCS, SIAPEC classification (*Società Italiana di Anatomia Patologica e Citopatologia Diagnostica -> Italian Society of Pathology and diagnostic Citopathology*) has been adopted.
This classification divides cytological samples into 5 classes (from Tir 1 to Tir 5). Each class has a meaning and entails different treatment opportunities.

The following lines give a description of procedure for each of 5 cytological classes.

**Tir 1**: nodules belonging to this class are “non-diagnostic”. This means FNA gave a sample which doesn’t allow diagnosis. From a technical point of view, it’s almost like the test had not been performed.

**Action**: according to our experience, Tir 1 nodule hardly turns out to be malignant, but in many cases FNA repetition is recommended after 2-3 months.

**Tir 2**: nodules belonging to this class are “benign” (or “hyperplastic”).

**Action**: if thyroid functions regularly, therapy is unnecessary and, in most cases, an over time surveillance program is set up (ultrasound every 2 years, for instance). On the contrary, in case nodule causes a thyroid malfunction, it might be necessary to take drugs. If nodule/s is/are or become becomes voluminous, surgical intervention for the removal of nodule might be recommended. Generally, after first classification nodules are monitored by General Practitioner (Family Doctor) who may ask for the cooperation of specialist doctor, if necessary.

**Tir 3**: nodules belonging to this class turn out to be “indeterminate”, that is the exam could not allow a definitive diagnosis (benign or malignant nodule). All in all, in 8 out of 10 cases (80%), Tir 3 nodules turn out to be benign, while 2 out of 10 (20%) turn out to be malignant.

At present, there are no further available tests to determine exactly whether a Tir 3 nodule is really benign. Moreover, in case of Tir 3 nodules, repetition of FNA is of little use in practical decision making and therefore discouraged.

**Action**: as there is a significantly high risk (20%) of malignant nodules, in most cases physician will recommend surgery. If nodule (or nodules) are located only in one thyroid lobe, surgery will mean removal of the concerned lobe, that is half of thyroid (hemithyroidectomy).

Histological test will be performed on the removed nodule, and the results will be available after about 20 days. In case nodule turns out to be malignant, it will be necessary to repeat surgery (1 month after first intervention) to remove the lobe left.

In case a Tir 3 lobe is associated to nodules in the other lobe, surgeon will remove the whole thyroid (total thyroidectomy). In a minority of cases, nodule Tir 3 patients might be suggested not to undergo surgical intervention, and to start a monitoring with blood tests, medical visits, and ultrasounds, followed by a new FNA.

This decision may rely on different aspects (patient’s age, general clinical conditions, comorbidity, nodule’s shape according to ultrasound and/or scintigraphy, thorough examination of cythologic sample, thyroid functionality, etc.).

In some cases, surgery could mean higher risks for patient in comparison to keeping nodule and undergo monitoring. Like any other choice, to go on with monitoring is a common decision by physician and patient as well.

**Tir 4**: nodules belonging to this class are “suspicious for malignancy”.

**Action**: more than 95% of Tir 4 nodules turn out malignant and are surgically removed. In these cases, surgery entails first of all the removal of lobe which contains the suspected nodule.
During surgery a quick interoperative hystologic examination is made (interoperative hystologic).

As it often happens, in case hystologic examination confirms nodule’s malignancy, even the remaining part of thyroid is removed during intervention. Otherwise, surgery ends up with removal of the only lobe where the nodule is. Nevertheless, a final hystologic exam will be made and the result will be available after 20 days. If hystologic examination proves the nodule to be malignant, in most cases it will be necessary to repeat surgery (about 1 month after first surgical intervention) to remove the lobe left.

**Tir 5:** Nodules belonging to this class are “malignant”.

**Action:** in these cases, surgery is recommended and it leads to the removal of entire thyroid (total thyroidectomy).

Sometimes, thyroid removal is associated to that of neck lymph nodes (dissection). This happens because thyroid tumor can sometimes reach these lymph nodes. In this case we have “lymphatic metastases” and they must be removed. Central neck lymph nodes might be removed together with thyroid (central neck dissection) even if the existence of metastases is not certain. This kind of surgery is slightly more invasive than thyroidectomy.

On the contrary, lateral neck dissection is performed only in suspected lymph nodes metastases. This kind of surgical intervention (lateral neck dissection) is more invasive if compared to thyroid removal (larger surgical scar, longer surgical intervention, higher risk of complications).

After surgery, so called radiometabolic therapy might be often suggested. This therapy is performed at Nuclear Medicine Unit, during a 3 day hospitalization in the area devoted to radiometabolic therapy, where radioiodine (Iodio-131 or 131I) is used.

Before and after therapy, patient undergoes medical tests, in particular scintigraphy.

After surgery and/or radiometabolic therapy, patient goes back to endocrinologist and they will jointly decide the best treatment.

As explained above, the type of treatment rely on many reasons. It is important to stress that patient always has the opportunity to choose from treatments other than those proposed by his physician. As a matter of fact, exchange of views between physician and patient has the aim of allowing a practical choice, shared by both of them; this is a paramount condition in order to allow the patient to face the situation with serenity.

**After treatment: follow-up**

After treatment, a period of medical monitoring on regular basis starts, the so called “follow up”. This means: blood tests, neck ultrasounds and other periodical exams. Usually, in the first years after surgery, the follow-up is performed at Endocrinology Day Hospital.

In the years following, patient may contact his General Practitioner (Family Doctor), who might rely on endocrinology units both at hospital or local health authority. In case of need, it is always possible to be taken on by Endocrinology Day Hospital again.

**Participation in clinical trials**

During treatment, patients might be suggested to partecipate in clinical trials. Clinical trials represent the only reliable way to assess whether new treatments (surgery, chemotherapy, radiation therapy etc.) are more effective than the already available ones.

In order to partecipate in a clinical trial, it is necessary to have features which differ from one trial to another. If patient has got characteristics to partecipate in a clinical trial, investigator gives him all information necessary to decide whether taking part to clinical trial or not.

For a patient taking part in a clinical trial, the course of treatment and follow up could differ in comparison to a patient following conventional treatment.

As a matter of fact, those who take part in clinical trials undergo a higher number of checkups. Anyway, endocrinologist will give patient all necessary information.
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