

Oncological TB Urology - process and data flow description

This document describes the process and the information flows for the oncological Tumorboard (TB) for Urology. The purpose of this document is to provide the input necessary for the design of the Vitaly platform which is intended to support the TB process, and the desired links with care systems in the various participating hospitals.

A process and information analysis must provide insight into the following questions:

1. What does the process look like?
2. Who are the actors in the process?
3. What data is necessary as input for each process step, and where was the information retrieved? (from which source)
4. Which data is generated as output for each process step and in which target system should it be stored;
5. Which links between the systems are required;
6. Which system or systems (HiX, Vitaly, PACS, XDS, etc.) are used by the actors, and what functionality of those systems is expected to support the process.

First the process is described, and an explanation is given for each process step.

Next, it is explained for each process step which data objects are used as input for that step, and which data objects are produced or modified as a result of that step. It is also indicated from which source the data objects are retrieved from and to which target system the produced or modified data objects are written.

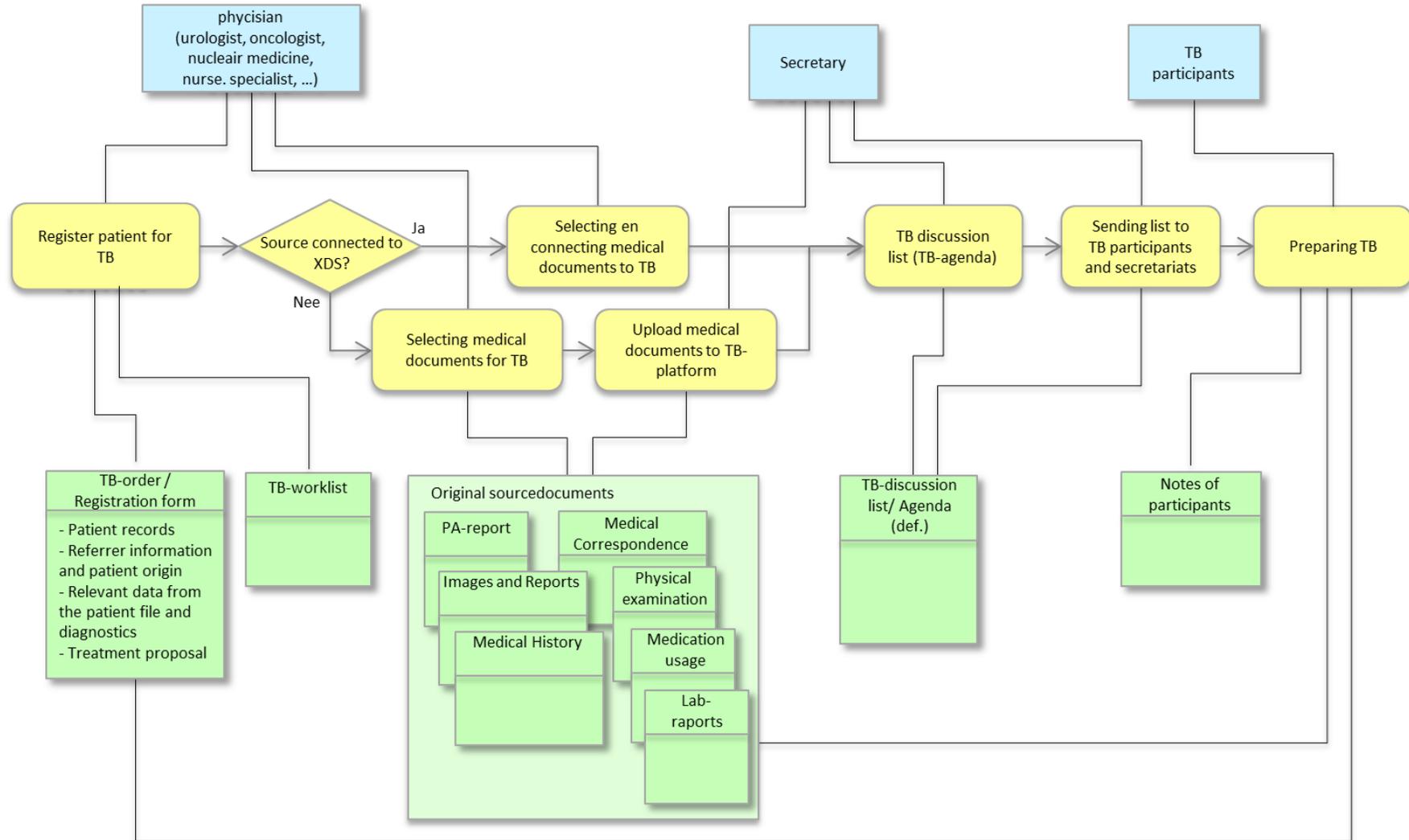
After this, a translation is made into requirements for the system.

Together with the requirements, in addition to the necessary functionality for one TB process, it is also described which functionality is needed for (future) support of multiple TB processes and reference flows within the Central Netherlands region.

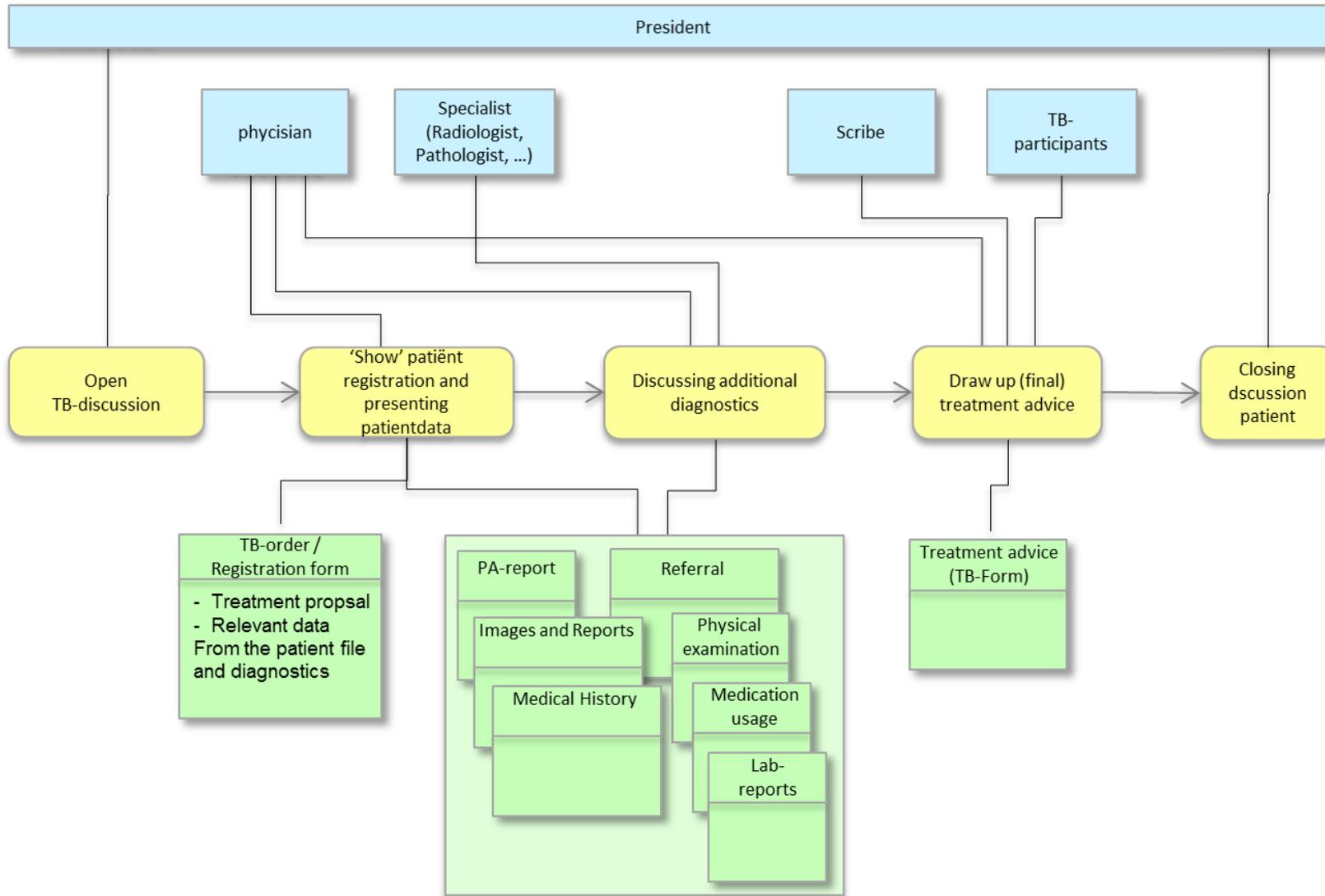
Assumptions

1. Care providers work exclusively in their own electronic file (EHR) or in the (regional) institution-wide electronic health application Vitaly (also called 'the TB application'). Healthcare providers do not work in the EHR of another institution.
2. To have diagnostic quality images available during the MDG, there are two options:
 - a. Import of the images in the PACS of the hospital where the TB takes place. The images can then be viewed with a PACS workstation.
 - b. To use a web (DICOM) viewer specially developed for this purpose that can retrieve the images from the source PACS in real time and display them in the original diagnostic resolution.
3. To automate the retrieval of previously registered data (registration at the source and re-use of data) as much as possible

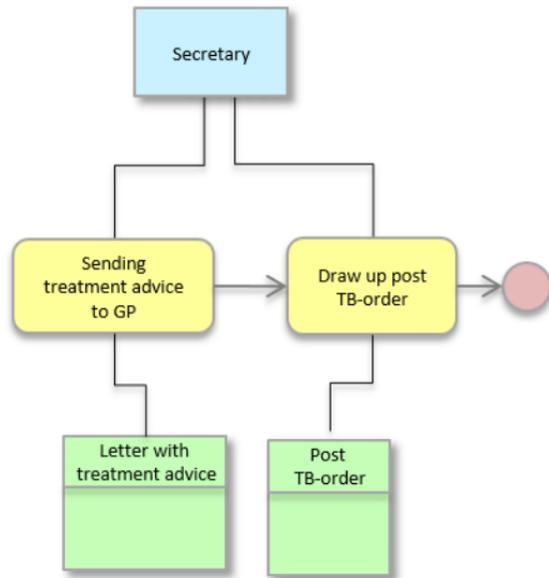
Preparing the Tumorboard



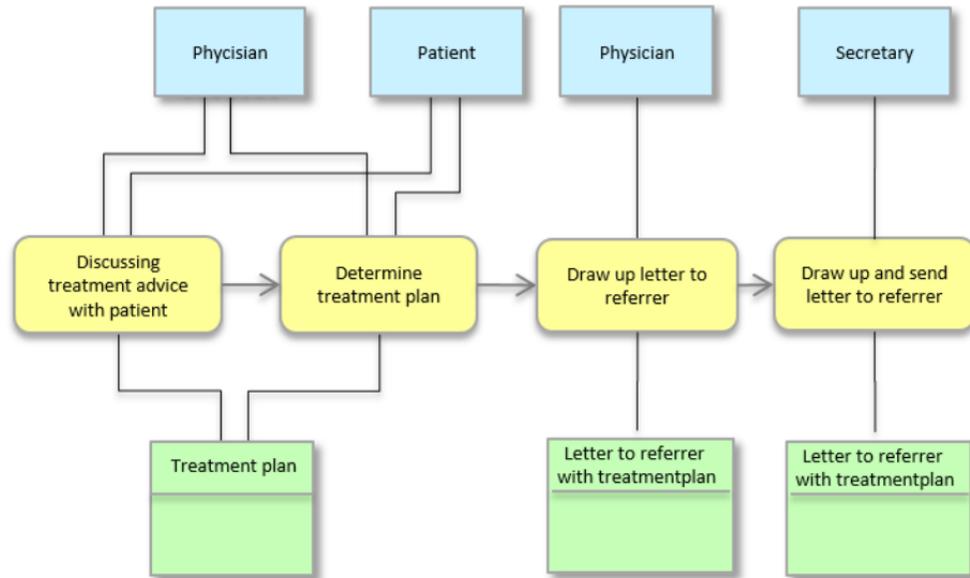
Executing the TB



Complete TB



Post TB clinic



Process description oncological MD Urology

General remarks

Who registers: All treating specialists (urologist, oncologist, radiotherapist, nuclear medicine and junior working doctors), as well as nursing specialists, (not: radiologist, pathologist).

Participants in the TB are: the same list as the practitioners but then including radiologists and pathologists.

Platform as a door to the other institution. Not having to upload everything but get access to the other person's file from the platform. That saves a lot of work.

Organizing a regional TB for four tumor types: bladder cancer, testis cancer, prostate cancer, kidney cancer.

Echeloning:

- Low complex: Formalities, which do not all need to be discussed
- Complex: regional TB
- High complex: Expert panel

	Process step	Actor	Comments
1.	Refer	General practitioner Other hospital Other in-house specialty	
2.	Perform intake, diagnostics, consultation discussing the results	Specialist, Radiologist, Pathologist,	Automatically report all output data to the XDS registry and, if necessary, record it in the central XDS repository.
3.	Register patient for TB (fill in TB form)	Practitioner: Specialist or Nursing specialist or junior doctor	<p>The referrer completes the TB registration form, and records on it all the information he considers necessary for the assessment of the patient during the TB. This data is taken from the patient file in EHR. This includes:</p> <ul style="list-style-type: none"> • Patient name and address data; • Referrer information and hospital of origin • Medical history • Oncological history, tumor type, TNM staging • Relevant blood tests , pathology and radiology report , research reports • the oncological treatment proposal <p>Where possible, the data is automatically (ie without overdoing) taken from the file. The TB registration form must contain all data (except the images) needed during the discussion. The registration form also states who presents this patient to the TB and if certain specialists should prepare this patient, for example, the radiologist or the pathologist or one or more of the other practitioners.</p> <p>The registration of a patient preferably takes place by placing an order from the EHR. This order is passed on to the TB application and the registration form is recorded there. This initiates the TB workflow. The TB order also ensures that the patient is placed on a worklist for the notifying Secretary to schedule on the discussion list for a specific TB (agenda block) and to collect the data necessary for the TB.</p> <p>As long as it is not possible to place an order from the EHR, the registration form must be filled in manually in the TB application.</p>
4.	Link medical documents to the TB	Practitioner	<p>If the source system (EHR, PACS) has been linked to XDS, the practitioner selects documents that may be of interest during the TB and connects it to the registration. Consider, for example, the radiology and pathology report. The documents remain in the source system but linking them to the TB makes it easy to view the original source documents during the TB, in addition to the data in the registration form.</p> <p>Images, must be imported via XDS into the PACS of the TB location (where the radiologist is present). This is a necessary step if you want to view the images in diagnostic quality during the TB and in preparation. (NB: There are also web viewers that can now do this. This could be an alternative to prevent unnecessary image transfer).</p>

	Process step	Actor	Comments
5.	Upload medical documents to TB platform	Secretary	If the source system is not linked to XDS, the practitioner or the medical secretary can manually upload relevant documents to the TB platform. It is, however, desirable that, in this case too, the practitioner, when registering, indicates which source documents and images are important, because the secretary cannot always assess this.
6.	Prepare TB discussion list (TB agenda)	Secretary	The secretary draws up the final discussion list / agenda for the TB on the basis of the worklist with registrations. Patients can be grouped per institution so that, for example, the pathologist or radiologist at a hospital only need to be present when discussing the patients from their hospital.
7.	Sending out the discussion list to TB participants	Secretary	The secretary sends a link to the discussion list (or a reminder that the discussion list is ready) to all TB participants, so that they can prepare the TB. (In principle, all participants can view the discussion list themselves, but it is nice to have it sent to you). The discussion list is also open to secretaries that need this information for planning of post-TB outpatient clinic (depending how soon after the TB the outpatient clinic takes place)
8.	Prepare TB	All TB participants	The participants can prepare the TB discussion themselves based on the discussion list that they have received. Radiologist or pathologist can record their comments in a comment section. It is desirable that the GP can also participate.
9.	Open TB	TB President	
10.	a) Select patient and b) present patient data	a) Secretary/Scribe b) Practitioner	The practitioner, who has also registered the patient for the TB, presents the patient case. If the practitioner cannot be present, he/she arranges a replacement for himself.
11.	Discuss additional diagnostics	Specialist (radiologist, pathologist, medical microbiologist, ...)	The specialist of the presenting hospital presents the results of the additional investigation. Use can be made of the original source documents such as images, radiology and pathology reports. If it concerns revision PA and radiology, then the explanation will be provided by the specialist who did the revision. The images are viewed jointly via the video conference, whereby the person discussing shares his / her images with the other locations.
12.	Treatment proposal	practitioner	The practitioner gives a summary of the disease and names his treatment proposal after the presentation of all additional examinations
13.	Compose (definitive) treatment advice		The definitive treatment advice is drawn up during the TB. The secretary records this, visible to all participants, in the TB form. The participants agree with this on the spot. Participants who are at a location other than the secretary read 'live' via the video conference (<i>question: is this also the case in practice? Is there sufficient screen space to share the report?</i>)
14.	Prepare TB participant list	Secretary	It is possible to make a default attendee list per TB. For each meeting it can be indicated (at the start of the meeting) who is and who is not present. Also during the TB meeting it can be indicated if people join or leave. The participant list per patient can easily be transferred/copied to the treatment device (no. 13) and into the letter to GP and referrer (no. 15).
15.	Sending treatment advice to the GP	Secretary	In accordance with SONCOS standards, the TB treatment advice is sent to the patient's doctor within 2 working days. In addition, the treatment advice will also be discussed with the patient (at the post-TB outpatient clinic, see below). It is desirable that the doctor has this information.
16.	Preparation of post TB order	Secretary	Preparation of the order which determines which follow-up actions must take place after the TB. This can be, for example, making an appointment with the patient to discuss treatment advice at the post-TB outpatient clinic.

	Process step	Actor	Comments
			But in anticipation of the post-TB discussion with the patient one or more orders can be made for further treatment, for example, a reference to the hospital that will perform the surgery. This is often possible because the treatment proposal has already been discussed with the patient before the TB.
17.	Discuss treatment advice with patient	Practitioner	The treatment advice is discussed with the patient at the post-TB outpatient clinic. Sometimes this happens on the same day, immediately after the TB, sometimes this happens the next day. Sometimes the patient has already discussed the treatment advice with his doctor prior to the post-TB outpatient clinic. The patient has the last saying and decides whether and how he wants to be treated further. The definitive treatment plan can therefore deviate entirely from the treatment advice.
18.	<i>Determine treatment plan</i>	<i>Clinician, Patient</i>	
19.	<i>Prepare and send letter to referrer</i>	<i>Secretary</i>	<i>The letter with the definitive treatment plan is sent to the referrer.</i>
20.	<i>Preparation of post TB order for follow-up process</i>	<i>?</i>	

TB process steps and data flow desired situation

	Process step	Actor	Data Input	Source system	Data Output	Target system	Transport via	Comments
1.	Refer	General practitioner or other hospital	Referral	HIS or EHR	Referral	EHR practitioner	ZorgDomein	
2.	Perform intake, diagnostics, results interview	Specialist, Radiologist, Lab, Pathologist, ...	Orders, Appointments	EHR, PACS, Glims , etc.	Results, Reports, Consultation Reports etc.	EHR, XDS infrastructure	Internal HL7, XDS	Automatically report all output data to the XDS registry and, if necessary, record it in the central XDS repository.
3.	Register patient for TB (fill in TB form and note treatment proposal)	Practitioner: Specialist or Nursing specialist	Patient name and address and medical data Question Treatment proposal	EHR practitioner Or Vitaly	TB order TB registration form containing all relevant data from the file for discussion, as well as the treatment proposal	TB application		
4.	Linking medical documents	Practitioner Secretary, Nursing specialist, EHR (automatic)	Lab results (pdf), PA report, Images and reports, Summary of medical data from file, Reference letter	EHR, PACS if necessary. other source systems	See Input	XDS, PACS system of TB location and / or TB application	XDS, HL7, FHIR, DICOM	<ul style="list-style-type: none"> • Is not a separate step for urologists. All relevant information is on the registration form. During the discussion the practitioner will ask the radiologist and pathologist to explain their research. • During the discussion, the urologists want to be able to return to the original source documents, such as the radiology and pathology report. • Documents have already been automatically registered at an earlier stage (process step 2) or can be registered manually in this process step. • Images can be imported via XDS into the PACS of the TB location. This is a necessary step if

	Process step	Actor	Data Input	Source system	Data Output	Target system	Transport via	Comments
								<p>you want to view the images in diagnostic quality during the TB.</p> <ul style="list-style-type: none"> Other documents are available for inspection via XDS (import to the TB application is possible but not necessary). <i>In the current situation, all required documents are first prepared (on a share) and then uploaded manually in XDS.</i>
5.	Upload medical documents to TB platform	Secretary	Lab results (pdf), PA report, Images and reports, Summary of medical data from file, Reference letter	EHR, PACS if necessary. other source systems	See Input	XDS, PACS system of TB location and / or TB application		<ul style="list-style-type: none">
6.	Prepare TB discussion list (TB agenda)	Secretary	List of registered patients	TB application	Agenda / Discussion list	TB application	-	<ul style="list-style-type: none"> <i>In the current situation, the Secretary is creating an TB order in HiX and download all required documents from the TB portal to HiX at the UMC Utrecht .</i>
7.	Broadcasting discussion list to TB participants	Secretary	Agenda / discussion list	TB application	Mail	Outlook email account from doctors		<ul style="list-style-type: none">
8.	Prepare TB	All TB participants	Discussion list, all available substantive documents	TB application, local PACS, XDS viewer	Notes Attendees	TB application	-	<ul style="list-style-type: none">
9.	Open TB	TB President						
10.	a) Call patient and b) present patient data	Secretary Practitioner	Discussion list, all available substantive documents	TB application, local PACS, XDS viewer, possibly own EHR per participant	-	-	-	
11.	Discuss additional diagnostics	Specialist (radiologist,	Discussion list, all available	TB application, local PACS, XDS viewer, possibly				

	Process step	Actor	Data Input	Source system	Data Output	Target system	Transport via	Comments
		pathologist, medical microbiologist, ...)	substantive documents	own EHR per participant				
12.	Preparation of (definitive) treatment advice	All TB participants, secretary		TB application	TB report	EHR		
13.	Prepare TB participant list	Secretary	Participants present	TB application	TB participant list	TB application	-	
14.	Sending treatment advice to the doctor	Secretary						
15.	Preparation of the TB order port	Secretary						
16.	Discuss treatment advice with patient	Practitioner Patient	Treatment plan	EHR	Final treatment plan	EHR	XDS, HL7 -	
17.	Determine treatment plan	Healthcare professional and patient						
18.	Prepare and send letter to referrer	Secretary Practitioner:	Consult	MSY application or EHR practitioner TB - application	Post TB letter Final treatment plan	EHR or HIS referrer* (2nd line specialist or GP) EHR	XDS, HL7, Edifact XDS, HL7	Post TB letter draft in EHR practitioner and then send to referrer OR: Post prepare TB letter in TB application, with RAKU format, and from there send to referrer??
19.	Preparation of post TB order for follow-up process	?		?	?	?	? XDS, HL7, Edifact	

The wish is that the participants in the TB, in addition to the information in the registration form, can also look back in the original source documents from which this information originates. This mainly concerns the radiology and pathology report, and the images.

It is preferable to leave the original source documents at the source and to offer the possibility to view them without having to transfer them to the TB platform. This saves a lot of work because they do not have to be fetched over as an extra process step.

Urology involves echeloning: low complex (hammer pieces, discussing in internal TB), complex (discussing in regional TB), high complex (discussing in expert panel).

Tumor Types: Bladder, Testis, Prostate, Kidney, Penis, UUT, other...

Requirements

Nr	Description	
1.	<i>All documents (results, reports, forms , images) that are important for the continuity of care in case of institution-transcending treatment of the patient are automatically registered by the institution systems on the central XDS infrastructure.</i>	
2.	A patient registration for the TB takes place on the basis of an order from the notifying institution's EHR. Hereby all known patient data that are important at registration are automatically included in the order. If registration from the EHR is not (yet) possible, the registration is entered directly into a registration form in the TB application. All registration in the TB application is done as much as possible on the basis of ZIB's (healthcare information buildingblocks) or other applicable standards.	
3.	A completed registration form automatically starts a TB workflow for the patient concerned.	
4.	Documents that must be available for the TB are automatically added to the registration (ie registered to the XDS registry if that had not already been done before).	
5.	Documents that must be available for the TB can be marked as such in XDS, after which they are automatically added to the registration.	
6.	Images that must be available for the TB, and that are marked as such, are - after pressing an 'export / archive' button - automatically imported into the PACS of the TB location, including the corresponding report. In this way the images are available in diagnostic quality during the TB. An alternative is a high-quality PACS viewer that is available in the TB application, so that images only have to be imported during further processing.	
7.	Documents for the TB are available for reference via a XDS viewer (consumer). If desired, these documents can also be imported into the TB application (and / or the EHR of the TB location).	
8.	Simple and fast way to upload documents if needed.	
9.	Data for the TB can be exchanged in a structured form so that the TB application or the EHR of the recipient can understand and process this data. (Structured means, in accordance with the standards that are used for this in the Netherlands: Health information building blocks in the form of FHIR resources or CDA documents).	
10.	Based on registered patients, the discussion list is automatically drawn up. The secretary can adjust the discussion list (adjust the order of patients, remove patients etc.).	
11.	It must be possible to sort the discussion list by all fields entered in the registration form. These fields are visible as columns in the discussion list. Examples of desired sorting: participating institution, tumor type, presence of an TB participant. Also multiple sortings at the same time, so for example: first by presenting institution, then by PA / RAD presence, then by tumor type. In addition, it is possible to manually arrange the discussion list in the correct order.	
12.	As soon as the discussion list is ready, a notification can be sent to all participants. The discussion list can then be viewed by all TB participants. With a change in status, e-mail notifications can be sent. Preferably, end users can set the status changes of which they wish to receive an email notification.	
13.	Prior to (during the preparation) and during the TB, the participants can write down their own notes or notes to share with the other participants in the TB.	
14.	The TB participant list can be drawn up by ticking or unchecking participants in the Standard TB_ Participant List per type of TB or adding incidental participants to it. During the meeting, participants can be checked or unchecked per patient. <u>AND / OR</u> : Phase 2: The TB participant list is automatically drawn up based on the users logged in to the TB application and can also be supplemented manually.	
15.	It is possible to invite guests for a single meeting or for a single patient's meeting. This guest will have access to the corresponding data.	

Nr	Description	
16.	During the discussion, participants in the TB can already look ahead to the patient to be discussed or look back at the patients already discussed on their own device.	
17.	It is possible to put the complete registration On Hold and post it to another TB date, without having to fill in the entire registration form again.	
18.	A report / treatment advice can be made during the TB. It is possible for participants at other locations to read along with the conclusion and policy.	
19.	The report with conclusions and policy is automatically sent to the EHR of the reporting specialist who has registered the patient for the TB. Other participating houses can easily transfer the report to their own EHR (with the click of a button).	
20.	Based on the information in the TB form and report, a letter can be drawn up and sent to a GP and / or referrer.	
21.	An order can be issued to the EHR of the practitioners who must take action. For example a post-TB outpatient clinic appointment or an order to start a certain treatment.	
22.	Simple and fast way to download / import data and documents.	
23.	The TB application provides an integrated representation of all data and documents belonging to a patient (and relevant for the TB). Data and documents can be viewed at any time by the participants of the TB and the relevant secretary.	
24.	Users of the TB application (participants in the TB) can log on to the TB application from the opened file of a patient in their own EHR, single sign on (SSO).	
25.	Users of the TB application (participants in the TB) can log on to the web version with the credentials (usually username + password) of their own organization (federated authentication). A condition for this is that they are within the walls of their own organization. If the latter is not the case, logging in is only permitted through strong authentication.	
26.	Use status codes as in Appendix 1 (or similar)	
27.	Groups of end users are easy to define and then adjusted as needed. For example, the "urology TB" group or "RAKU TB" group.	
28.	Groups can change per type of TB or referral stream. There may be differences in the allocation of roles and rights between the hospitals participating in an TB.	
29.	Users can be members of multiple groups and can easily switch between groups. They do not have to log in again for this.	
30.	Users can also have different roles in different groups. For example, in one group they register patients for a TB. In the other group, they process the references (arising from an TB) to a specific department.	
31.	Depending on the tumor type and treatment options, there may be several recipients / processors of a referral stream. Consider HIPEC treatments for gynecological tumors that are done at multiple institutions. Sometimes the TB refers to one institution, the other time to another.	
32.	It is possible to set up a registration form based on how the TB is organized. Sometimes there is one TB for one tumor type, sometimes several tumor types are discussed in one TB.	
33.	The discussion list can also take both forms.	
34.	The data registered in the registration form and TB report can be reused. For example in the TB report, a TB letter, but also for reports, counts and quality records.	
35.	When data is reused for research or quality registrations, the processing of this data must comply with the rules in the field of privacy / anonymity.	
36.	The operation of the logistic 'head' and 'tail' of the form is the same for all tumor types and TBs. This also applies to the steps in the workflow.	
37.	It is possible at all times for all TB stakeholders to see the status of an TB registration.	
38.	It is possible to designate different roles per user group (TB). On the one hand for the administrative processing of a notification, on the other hand for the different medical specialists involved in the TB.	
39.	It is possible to extract data from the TB portal to get an overview of all discussed pt / tumors / stages / involved specialists./ ...	

Appendix 1

Statuses

Register and submit

Processing

Additional information (from applicant)

Additional information needed (from processor)

Withdraw

Reject

TB started

TB treatment advice