# French Liver Allocation Policy Handbook

Agence de la biomédecine

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# INTRODUCTION

The *Agence de la biomédecine* (henceforth the *Agency*) is responsible for the allocation of liver grafts in France. The Agency, in collaboration with liver transplantation professionals, sets the terms and conditions of the organ allocation system. The *Agency* manages the national organ waiting list and offers organs to transplant teams for specific patients, in the order established by the liver allocation score. The teams' physicians make the final decision of whether or not to accept the organ for the patient.

An allocation system must respond to candidates' medical needs suitably, efficiently, and equitably. For some patients, the solution is to propose a "priority" transplant, and patients with a critical condition (such as fulminant hepatitis or a nonfunctioning organ requiring a re-transplant) receive a national priority called "high urgency"; they accounted for 9.4% of the inscriptions on the waiting list in 2014.

In most cases, prioritizing different medical diagnoses is impossible. The allocation system must therefore find a compromise between equity, efficiency, and feasibility.

The most efficient solution that offers fair access to transplantation is an allocation score.

The allocation of liver grafts distinguishes 3 categories: "high urgency", liver score (since 2007), and "graft that nobody wanted" (after some expanded-criteria livers have been refused 5 times, they are offered to a team for a patient of their choice to optimize the donor-recipient matching).

The liver score is calculated for each patient registered on the waiting list. The score represents each patient's individual priority rating and therefore allows the attribution of an organ to a specific patient, and not to a team.

The liver score takes into account the type of diagnosis, the gravity of the patient's condition (MELD score for cirrhosis, the alpha fetoprotein (AFP) score for hepatocellular carcinomas), the time spent on the waiting list, and the distance between the procurement and transplant centers.

In the absence of a priority candidate, every single liver retrieved in France is proposed to the patient with the highest score in the country.

The liver score relies on the use of the MELD (Model for End-stage Liver Disease) indicator. This indicator helps prioritize candidates on the waiting list as to their risk of death without access to a liver transplant. This way, organs are offered to candidates with the worst condition, but who will benefit the most from the transplant. However, the score avoids, when possible, transplantations of patients who could safely remain on the waiting list. [1] [2]

[1] Wiesner, R. H., McDiarmid, S. V., Kamath, P. S., Edwards, E. B., Malinchoc, M., Kremers, W. K., ... & Kim, W. R. (2001). MELD and PELD: application of survival models to liver allocation. Liver transplantation, 7(7), 567-580.

[2] Merion, R. M., Schaubel, D. E., Dykstra, D. M., Freeman, R. B., Port, F. K., & Wolfe, R. A. (2005). The survival benefit of liver transplantation. *American Journal of Transplantation*, *5*(2), 307-313.

The liver score takes the MELD score into consideration only for candidates with either isolated cirrhosis without cancer (49.6% of the candidates on the waiting list in 2014) or TNM1 stage hepatocellular carcinomas (HCCs).

For patients with TNM2 stage HCC (32% of the waitlisted candidates in 2014), which generally occurs after cirrhosis, the liver score takes into account:

- The MELD score and the time spent on the waiting list, which enables transplantation teams to prioritize their patients within a period during which the patients are eligible for liver transplantation.
- The AFP score, which identifies patients with a substantial risk (> 50%) of HCC recurrence after transplantation, to avoid futile utilization of a liver.[3]
- The occurrence of a possible contraindication to a treatment for TNM2 HCC, in patients with a MELD score < 15, and an HCC recurrence 6 months after the tumor treatment.

The calculated MELD score does not reflect all clinical situations; in particular, it does not cover events such as ascites, digestive hemorrhage, metabolic diseases, polycystosis, and others. For this reason, the *Agency*, in collaboration with the relevant specialized medical associations (ACHBT[4] and AFEF[5]) acknowledged MELD score exceptions and created specific "expert component" requests for those specific diagnoses, with pre-established criteria that depend on the specific disease. Two to three experts from the French Hepatology College review these requests and may allocate 650 or 800 additional points to the patient's MELD score, either immediately or monthly over a period of 3, 6, or 9 months.

## II. COMPUTATION OF THE LIVER SCORE

This computation includes 2 stages:

A. Computation of the liver score, distance excluded
B. Computation of the final liver score.

[3] Duvoux, C., Roudot–Thoraval, F., Decaens, T., Pessione, F., Badran, H., Piardi, T., ... & Liver Transplantation French Study Group. (2012). Liver transplantation for hepatocellular carcinoma: a model including α-fetoprotein improves the performance of Milan criteria. Gastroenterology, 143(4), 986-994.
[4] ACHBT : Association de Chirurgie Hépato-Bilio-Pancréatique et Transplantation Hépatique https://www.achbt.orr
[5] L'AFEF : Association Française pour l'Étude du Foie

# A. COMPUTATION OF THE LIVER SCORE, DISTANCE EXCLUDED

This first step in the computation of the liver score considers only the patient's degree of medical urgency, that is, his or her likelihood of survival without a transplantation. It therefore does not take into account distance between the procurement and transplantation centers.

The "distance excluded" liver score is a sum of different components, each offering an organ access rate suitable for each diagnosis. That is, the optimal rate of speed for organ access depends on the underlying disease and its direct or delayed gravity (HCC, hepatic cirrhosis, fulminant hepatitis) and aims to minimize the risk of death on the waiting list.

The score assigns a candidate to a specific component, based on the product of the indication function (diagnosis), a weight, and a function that takes into account both the MELD score and the time on the waiting list.

- The diagnosis, that is, the indication for transplantation, is associated with a specific function that does or does not activate the component (1= activated/0=not activated)
- The weight determines the maximum number of points allocated to the component and regulates the competition within each diagnosis.
- The function associated to each component takes each candidate's MELD score and waiting time into account, to respond to the urgency of the patient's condition (immediate or deferred) with an appropriate rate of access to a liver.

The "distance excluded" liver score is composed of 3 factors:

1. **The indication for transplantation**
2. **The MELD score**
3. **The waiting time.**

For candidates with HCC, a fourth factor is considered: the AFP score, which enables us to identify candidates with HCC too advanced to be treated by transplantation: it is a marker that the cancer will recur. These patients are excluded from the waiting list.

4. **AFP score**

Those factors are determined by data from the CRISTAL database. Each item affects organ attribution, access to transplantation, and the risk of death on the waiting list. These data must therefore all be recorded — and accurately — in the CRISTAL database.

# 1. Indication for transplantation

The indication for transplantation or the request for priority matches each candidate with one of the following 11 components:

***Table 1: Liver score components***

| Liver score components | Component code | Priority request |
|---|---|---|
| TNM1 stage hepatocellular carcinoma component | HCCTNM1 | |
| TNM2 stage hepatocellular carcinoma component | HCCTNM2 | |
| TNM2 HCC recurrence component | HCTNM2RC | |
| TNM2 HCC remission component | HCTNM2RM | |
| Cirrhosis (without HCC) | CIRRH | |
| Re-transplantation (without high urgency) | ReTR | |
| Hepatic tumor (non-HCC) | HTNHCC | |
| Noncirrhotic hepatic disease | NCHD | |
| Expert MELD 800-point component (MELD exception 1) | XPF800 | ➔ mandatory |
| Expert MELD 650-point component (MELD exception 2) | XPF650 | ➔ mandatory |
| Expert HCC-CI 650-point component | XPFHCC-CI | ➔ mandatory |

The CRISTAL database matches the candidate with components based on:

- information listed in the “initial disease” section of the candidate’s medical record
- the existence of a previous transplantation
- a request for an "Expert” component

## a. Hepatocellular carcinomas (HCC)

The scoring system allocates the candidate to either a TNM1 or a TNM2 HCC component based on the data “***number of tumors***” and “***size of the largest tumor***” collected at different stages:

- Baseline, on tumor diagnosis
- At waiting list registration
- Between registration and transplantation, in case of any change.

If a tumor worsens, updating the data might result in a change of component from TNM1 to TNM2.

A TNM2 patient will stay in that component, even if treatment improves the cancer's characteristics.

- Hepatocellular carcinoma stage TNM=1 component (HCCTNM1)
    - Is activated:
        - If at least one initial disease is “hepatocellular carcinoma”
        - And there is a single tumor, measuring less than 2 cm
        - And no initial disease is “elective retransplantation”
        - And the number of previous liver transplants = 0
        - And no “expert component” has been granted.

When activated, the score of the HCCTNM1 component is equal to 1. If not activated, the score is 0.

This score changes only when the MELD score changes, regardless of the time spent on the waiting list. The MELD score parameters must be updated at least every 3 months.

- Hepatocellular carcinoma stage TNM≥2 component (HCCTNM2)
    - Is activated:
        - If at least one initial disease is “hepatocellular carcinoma”
        - And there is more than one tumor, or one tumor with a diameter ≥ 2 cm (on at least one examination)
        - And no initial disease is “elective retransplantation”
        - And the number of previous liver transplants = 0
        - And no “expert component” has been granted.

When activated, the score of the HCCTNM2 component is equal to 1. If not activated, the score is 0.

The patient file must be updated every 3 months for:

- The MELD score data. The MELD score affects the number of points allocated to the liver score (including the time spent on the waiting list).
- The tumor characteristics (*number of tumors, size of the largest tumor, alpha fetoprotein* level), to update the AFP score. If not updated, the missing values from the AFP score will be assigned with the highest values, the AFP score will be >2, and no liver can be offered to the patient.

- The recurrence component HCCTNM ≥2 (HCTNM2RC)
  - Is activated:
    - If at least one initial disease is “hepatocellular carcinoma”
    - And of the **tumor baseline characteristics**:
      - The single tumor was larger than 2 cm
      - And the AFP score was ≤ 2
      - And the tumor was treated only with radiation and/or surgical resection
      - And the tumor was no longer active after the treatment
    - And of the **tumor characteristics at registration on the waiting list**:
      - The item **tumor recurrence** = Yes
      - And the recurrence occurred at least 6 months after the treatment
      - And the AFP score was ≤ 2
    - And no initial disease was “elective retransplantation”
    - And the number of previous liver transplants = 0
    - And no “expert component” has been granted.

- The remission component HCCTNM≥2 (HCTNM2RM)
  - Is activated:
    - If at least one initial disease was “hepatocellular carcinoma”
    - And of the **tumor baseline characteristics**:
      - The single tumor was larger than 2 cm
      - And the AFP score was ≤ 2
      - And the tumor was treated only with radiation and/or surgical resection
      - And the tumor was no longer active after the treatment
    - And of the **tumor characteristics at and after registration on the waiting list**:
      - The item **HCC**: Hepatic Tumor = No
      - And the AFP score is ≤ 2
    - And no initial disease is “elective retransplantation”
    - And the number of previous liver transplants = 0
    - And no “expert component” has been granted.

HCTNM2RM patients, like patients with cirrhosis, will receive their MELD score points. An active tumor recorded in a pretransplantation checkup does not activate the recurrence component HCTNM2RC, but does reactivate an HCCTNM2 component. In addition, the patient’s waiting time points will be added to the score.

The alpha fetoprotein score (AFP score) must be ≤ 2 in all pretransplantation checkups, for all patients with HCC. This score must be updated every 3 months (i.e., the *number of tumors, size of the largest tumor, and the AFP* level).

### b. Isolated cirrhosis component (CIRRH)

- Is activated:
  - If at least one initial disease is part of the cirrhosis category
  - And no initial disease is part of the tumor category
  - And no initial disease is "elective retransplantation"
  - And the number of previous liver transplants = 0
  - And no "expert component" has been granted.

When activated, the score from the CIRRH component is equal to 1. If not activated, the score is 0.

The MELD score must be updated every 3 months. If not updated, it is set at its minimum value, until all mandatory data have been updated (*bilirubin, INR/Factor V, creatinine*).

### c. Retransplantation component (ReTR)

- Is activated:
  - If at least one initial disease is "elective retransplantation"
  - Or the number of previous liver transplants is ≥ 1
  - And no "expert component" has been granted.

When activated, the score from the If (ReTR) component is equal to 1. If not activated, the score is 0.

When CRISTAL identifies that the patient has had a previous liver transplant, it classifies the patient in the ReTR component, regardless of the indicated initial diseases.

A patient seeking a high-urgency (SU) retransplantation is classified in the retransplantation component until the expert from the *Agency* grants the SU component.

The MELD score must be updated every 3 months. If not updated, it is set at its minimum value, until updating of all the mandatory data (*bilirubin, INR/Factor V, creatinine*).

### d. Hepatic tumor – nonhepatocellular carcinoma component (HTNHCC)

- Is activated:
  - If at least one initial disease belongs to the tumor category
  - And no initial disease is “hepatocellular carcinoma”
  - And no initial disease is “elective retransplantation”
  - And the number of previous liver transplants = 0
  - And no “expert component” has been granted.

When activated, the score from If (HTNHCC) component is equal to 1. If not activated, the score is 0.

The MELD score must be updated every 3 months. If not updated, it is set at its minimum value, until complete updating of the mandatory data (*bilirubin, INR/Factor V, creatinine*).

### e. Noncirrhotic hepatic disease component (NCHD)

- Is activated:
  - If no initial disease belongs to the “cirrhosis” category
  - And no initial disease belongs to the “tumor” category
  - And no initial disease is “elective retransplantation”
  - And the number of previous liver transplants = 0
  - And no “expert component” has been granted.

When activated, the score from If (NCHD) component is equal to 1. If not activated, the score is 0.

The MELD score must be updated every 3 months. If not updated, it is set at its minimum value, until complete updating of the mandatory data (*bilirubin, INR/Factor V, creatinine*).

### f. MELD exception 1: The 800-point expert component (XPF800):

An 800-point expert component can be requested in the following situations:

- Recurring gastrointestinal hemorrhages
- Hepatopulmonary syndrome
- Portopulmonary hypertension
- Resistant pruritus
- Recurring cholangitis
- Hereditary hemorrhagic telangiectasia (Rendu-Osler disease)
- Polycystic liver disease
- Amyloid neuropathy

- Hilar cholangiocarcinoma
- Neuroendocrine liver metastases
- Epithelioid hemangioendothelioma
- Primary sclerosing cholangitis
- Primary biliary cholangitis

Only experts can activate this component. The score from this component If(XPF800) is worth 1 if activated, 0 if not.

## g. MELD exception 2: The 650-point expert component (XPF650)

A 650-point expert component can be requested in the following situations:

- Chronic hepatic encephalopathy
- Refractory ascites
- Hepatocarcinoma with no possibility of bridge treatment until transplantation

Only experts can activate this component. The score from this component If(XPF650) is worth 1 if activated, 0 if not.

## h. The 650-point HCC-contraindication expert component (XPFHCC-CI)

A 650-point HCC-CI expert component can be requested:

- If at least one initial disease is “hepatocellular carcinoma”
- And more than 1 tumor is detected OR the tumor size is ≥ 2 cm in any checkup
- And no initial disease is “elective retransplantation”
- And the number of previous liver transplants = 0
- And the treatment is contraindicated
- And the AFP score is ≤2
- And the MELD score is <15

Only experts can activate this component. The score from this component If(XPFHCC-CI) is worth 1 if activated, 0 if not.

### *Execution of the Expert component:*

A group of medical experts respond to the “expert component” requests. If they grant it, they specify the time when the maximum value of the points (650 or 800) shall be allocated. The patient may receive the maximum amount of points:

- Immediately (in a life-threatening emergency)
- Within 3, 6 or 9 months, depending on the urgency involved
- 12 months (mostly for some pediatric indications).

## 2. MELD score

The MELD score is based on three laboratory variables — c***reatinine***, ***bilirubin,*** and ***INR*** from the most recent pretransplantation update.

The initial MELD score formula is:

MELD score = 0.957 × $\text{Log}_e$(***creatinine*** mg/dL) + 0.378 × $\text{Log}_e$(***bilirubin*** mg/dL) + 1.120 × $\text{Log}_e$(***INR***) + 0.6431

The liver score uses a "rounded" MELD with integer values from 6 to 40. To obtain this rounded MELD score, the initial score must be multiplied by 10 and rounded to the closest integer (no higher than 40).

When ***creatinine***, ***bilirubin,*** or ***INR*** values are missing or ≤1, the value of 1 is automatically applied instead. **The patient then receives a very low MELD score value.**

The maximum value considered for c***reatinine*** is 4 mg/dL (= 352 µmol/L). If the patient is on dialysis, the ***creatinine*** value is automatically set at 4 mg/dL.

The complete MELD score formula is:

MELD = **min** [**round** (10 × **max** (0.957 × **Log**$_e$ (if (***Dialysis***=Yes; 4; **max** (**min** (***creatinine*** mg/dL; 4); 1))
+ 0.378 × **Log**$_e$(**max**(***bilirubin*** mg/dL; 1)) + 1.120 × **Log**$_e$(**max**(***INR***;1)) + 0.643)); 40).

CRISTAL automatically converts the units from the checkup data. The conversion rate is:

- For ***creatinine***: 0.0113 µmol/L = 1 mg/dL
- For ***bilirubin***: 0.06 µmol/L = 1 mg/dL

If the patient is treated with oral anticoagulants (anti-vitamin K), the ***INR*** value will depend on the ***Factor V*** value:

***INR*** = (***Factor V*** [% of normal]/94.9)$^{-0.81}$

## 3. Waiting time

The CRISTAL application automatically computes the waiting time (in months) between the date of the medical inscription and the date of the organ proposition.

The waiting time is used as an empirical criterion for organ allocation when the transplant can be delayed (no emergency transplantation, for example: HCC). It also separates patients with identical MELD scores.

## 4. Alpha-fetoprotein score (AFP score)

The AFP score restricts transplantation access for HCC patients at an advanced tumor stage.

The AFP score used in the liver graft allocation system comes from a French study of an allocation model that improves identification of patients at high risk of a post-transplant HCC relapse (which would cancel out the benefits of the transplant).[6] The AFP score applies if one of the initial diseases is hepatocellular carcinoma (HCCTNM1 and HCCTNM2).

CRISTAL computes the AFP score based on the 3 parameters found in the Inscription checkup and the pretransplantation checkup: ***number of tumors, size of the largest tumor, AFP level.***

This table specifies the points granted, according to these parameters.

**Table 2: Tumor size, number, AFP**

| Parameter | Number of points |
|---|---|
| Size of the largest tumor (cm) | |
| ≤ 3 | 0 |
| 3 - 6 | 1 |
| > 6 | 4 |
| Number of tumors | |
| 1 - 3 | 0 |
| > 4 | 2 |
| Alpha-fetoprotein (ng/mL) | |
| ≤ 100 | 0 |
| ]100 – 1000] | 2 |
| > 1000 | 3 |

The AFP score results from the sum of:

- The number of points corresponding to the ***size of the largest tumor***
- The number of points corresponding to the ***number of tumors***
- The number of points corresponding to the ***AFP*** value.

[6] Duvoux, C., Roudot–Thoraval, F., Decaens, T., Pessione, F., Badran, H., Piardi, T., ... & Liver Transplantation French Study Group. (2012). Liver transplantation for hepatocellular carcinoma: a model including α-fetoprotein improves the performance of Milan criteria. Gastroenterology, 143(4), 986-994.

If the initial disease is “HCC”, the tumor characteristics and the AFP level must be updated every 3 months.

If the tumor and AFP data are not updated 3 months after the previous update, the AFP score automatically use the maximum values for its missing variables. It is therefore >2, which means that the liver score cannot allocate any organ. These patients, however, can still be offered a "graft that nobody wants".

## B. COMPUTATION OF THE FINAL LIVER ALLOCATION SCORE

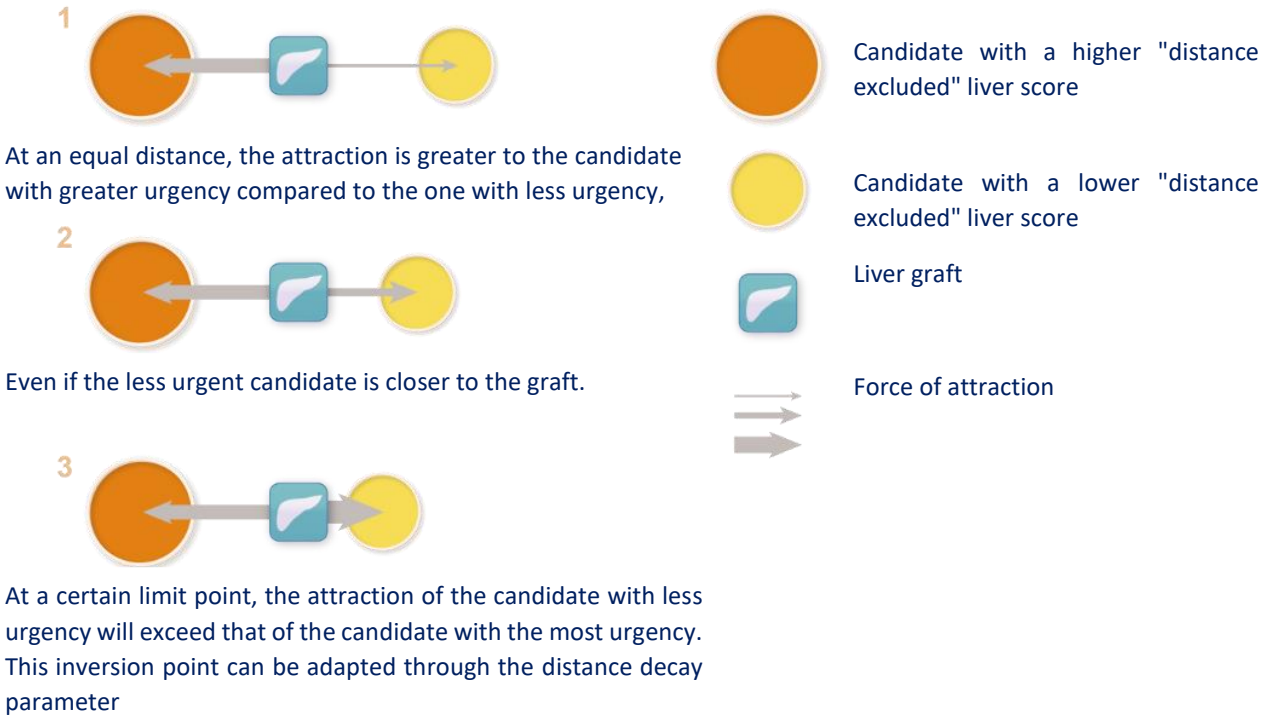
The final liver score computation incorporates a balance between the urgency of transplanting a specific patient and the distance between the procurement and transplant centers.

The "distance excluded" liver score (MELD, hepatic pathology, and waiting time) estimates the urgency of the transplant.

CRISTAL provides the distance value, that is, the distance by road (in minutes). A patient with a higher “distance excluded” score may be eligible for a more distant graft.

The current gravity model has been set to move grafts over a large distance only for the candidates with the greatest urgency; most grafts are used locally. Parameters from the gravity model are adjusted by simulations.

***Figure 1: Principle of the Gavity model***[7]




[7] Bayer, F., Audry, B., Antoine, C., Jasseron, C., Legeai, C., Bastien, O., & Jacquelinet, C. (2021). Removing administrative boundaries using a gravity model for a national liver allocation system. American Journal of Transplantation, 21(3), 1080-1091.

The interaction score × distance is no longer taken into account for grafts from donors younger than 40 years old to patients aged 15 to 39 years. This exception improves the age matching for these candidates under 40.

The following formula defines the final liver score:

**Final liver score = If donor's age < 40 AND 15 ≤ patient's age < 40 then:**

$$\text{liver score (distance excluded)}$$

**Otherwise:**

$$\frac{\text{Liver score (distance excluded)}}{f\left(\text{Distance between the procurement and transplant centers}\right)}$$

In conclusion, the final liver score allows a fair ranking of patients on the waiting list and avoids preferential treatment of one component over the others.

# REFERENCES

Wiesner, R. H., McDiarmid, S. V., Kamath, P. S., Edwards, E. B., Malinchoc, M., Kremers, W. K., ... & Kim, W. R. (2001). MELD and PELD: application of survival models to liver allocation. *Liver transplantation*, *7*(7), 567-580.

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# APPENDIX

## 1. Detailed calculation of the liver score, distance excluded

### Components calculation:

Every component of the liver score, distance exclude is based on the product of:

- an indicator function called IF(*Condition*) which is assessed to 1 (if the condition is true) or 0 (if false)
- a weight which determines the maximum number of points allocated to the component
- a generic function called G which allows to offer transplant access kinetics adapted to each component by tuning the value of its parameters.

The G function was designed to model the urgency to transplant a patient, whatever the diagnosis, and to be able to:

- provide transplant access kinetics adapted to the diagnosis, by tuning the parameters of the G function according to the results of simulations before implementation in Cristal
- combine efficient interaction between MELD score (MELD) and waiting time (WT)
- manage the competition between patients from different components [example : HCCTNM2 vs CIRRH]
- manage the competition between patients from the same component [example : HCCTNM2 with MELD=6 and WT=18 months vs HCCTNM2 with MELD=30 and WT=2 months]

The G function was set up with:

- 2 parameters related to the patient: the **MELD** score and the waiting time (**WT**)
- 5 common parameters for every patient of a given component to adapt the shape of the G function to the transplant access kinetics targeted. Theses parameters are labeled :
    - Discriminating Power of the MELD score: **Pmeld** (%)
    - Delay in taking into account the Waiting Time: **DWT** (months)
    - Transplantability Window: **TW** (months)
    - MELD score Attenuation Coefficient over the time: **MACtime** (%)
    - Upper Bound MELD Score : **UBM**

For the Expert MELD components XPF800, XPF650, XPFCHC-CI, the calculation of the liver score, distance excluded takes into account the following parameters:

- Waiting time in the XPF... component : **WTXPF**
- Delay granted by experts to obtain 100% of the XPF... component weight : **0, 3 , 6, 9, 12 months**

## 2. Calculation of the liver score, distance excluded

The liver score, distance excluded is a sum of components, each being the result of the product of an indicator function, a weight and generic G function.

In the current version, the calculation is:

Indicator function x Weight x G Function ([MELD,WT],[Pmeld, DWT, TW, MACtime, UBM])

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| IF(CIRRH) | 1000 | MELD | WT | 100% | 0 | 0 | 0 % | 40 |
| + IF(HCCTNM1) | 1000 | MELD | WT | 100% | 0 | 0 | 0% | 40 |
| + IF(HCCTNM2) | 1000 | MELD | WT | 95% | 3 | 10 | 80% | 33 |
| + IF(HCCTNM2RM) | 1000 | MELD | WT | 100% | 0 | 0 | 0 % | 40 |
| + IF(HTNHCC) | 900 | MELD | WT | 60% | 0 | 12 | 0% | 40 |
| + IF(NCHD) | 900 | MELD | WT | 80% | 3 | 15 | 0% | 40 |
| + IF(ReTR) | 1000 | MELD | WT | 90% | 1 | 6 | 0% | 40 |

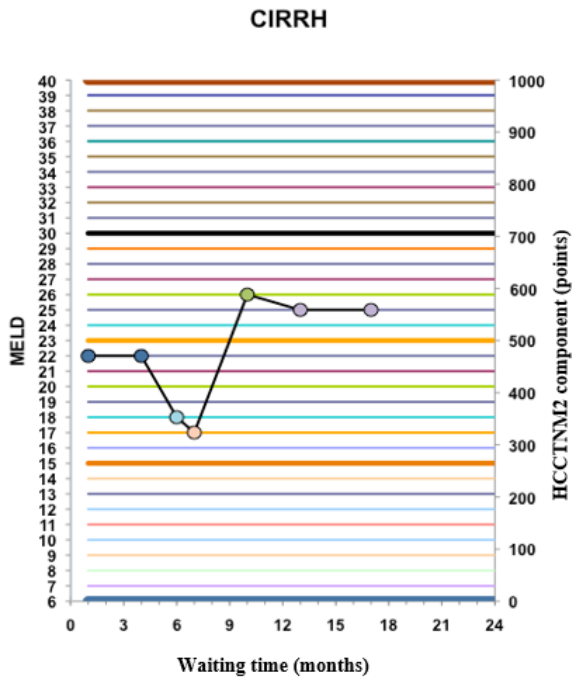
Indicator function x Weight x fct(WTXPF, [delay in months])

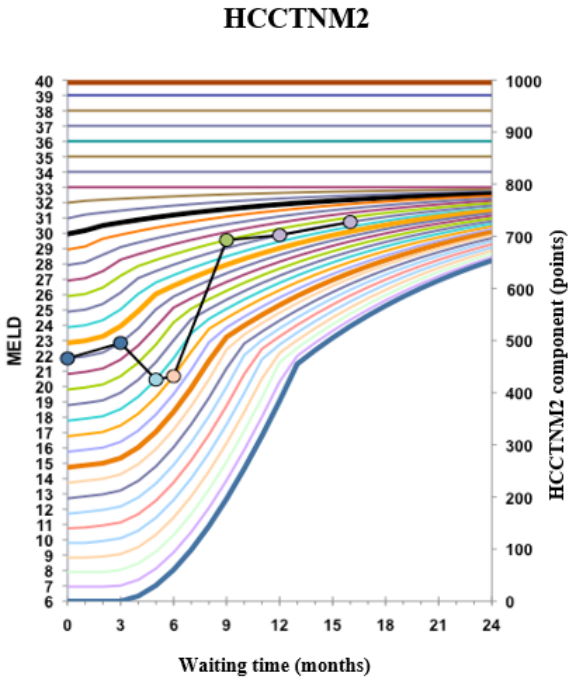
| | | | |
|---|---|---|---|
| + IF(XPF800) | 800 | WTXPF | 0, 3 , 6, 12 |
| + IF(XPF650) | 650 | WTXPF | 0, 3 , 6, 12 |
| + IF(XPFHCC-CI) | 650 | WTXPF | 9 |
| + 10 x (WT) | | | |
| x Si (AFP score ≤2) | | | |

Indicator function x Weight x fct(WTRecurrence, [delay in months])

| | | | |
|---|---|---|---|
| + Si(HCCTNM2RC) | 650 | WTRecurrence | 6 |

## 3. Evolution of the transplant access kinetics according to the values of the G function parameters




| Component parameters | CIRRH |
|---|---|
| Weight | 1000 |
| Pmeld | 100% |
| DWT | 0 months |
| TW | 0 months |
| MACTime | 0% |
| UBM | 40 |

| Component parameters | HCCTNM2 |
|---|---|
| Weight | 1000 |
| Pmeld | 95% |
| DWT | 3 months |
| TW | 10 months |
| MACTime | 80% |
| UBM | 33 |

**Isolated Cirrhosis**

Score based on the gravity measured by the MELD score, independent of the time

**Hepatocellular Carcinoma**

Score based on the the waiting time (WT) / MELD score. The HCCTNM2 graft acces becomes gradually independant of the MELD

| Points Score | MELD 6 | MELD 10 | MELD 15 |
|---|---|---|---|
| WT 6 months | 60 | 193 | 363 |
| WT 12 months | 384 | 492 | 568 |
| WT 18 months | 566 | 607 | 654 |
| WT 24 months | 653 | 678 | 707 |