

Chapter 8

ET Intestine Allocation System (EIAS)¹

¹ Under the auspices of the ET Liver and Intestine Advisory Committee (ELIAC)

Change record

Date	Author	Version	Change reference
23-01-2024	M van Bruchem	4.1	Implementation transplant capacity intestine, HU and ACO recipients excluded
12-09-2023	M de Rosner – van Rosmalen	4.0	Implementation of P-LAC02.16 Intestine – Audit procedure for intestine High Urgency status, R-LAC03.16 Intestine – HU intestine status, R-LAC04.16 Intestine – Intestine allocation scheme Recommendation, R-LAC05.16 Intestine – HU liver request in case of impending intestinal failure in a patient on the liver waiting list, R-LAC06.16 Intestine – HU liver request for recipients also in need of intestine, R-LAC07.16 Intestine – ACO status request including pancreas for anatomical reasons, P-LAC09.16 Intestine – Blood group preference in intestine offers, P-LAC11.16 Intestine –Intestine donor profile, R-LAC12.16 Intestine – composition of the intestine graft, R-LAC13.16 Intestine – Abdominal wall, P-LAC16.16 Intestine - Definition of graft function, P-LAC17.16 Intestine – Diagnosis list for intestine waiting list registration, P-LAC18.16 Intestine - Registry follow up items.
22-11-2016	M van Rosmalen	3.1	Implementation P-LAC08.16 and P-LAC10.16
19-06-2015	M van Rosmalen	3.1	Comments for allocation
July 2014	M van Rosmalen	3.0	Textual Adjustments
08-03-2013	J de Boer	2.0	Textual Adjustments
13-sept-12	L Boogert	1.2	Text added page 2
10-dec-10	L Boogert	1.1	Adaption Chapter 8.2.4, Recommendation Intestine vs. Pancreas allocation in case of procurement difficulties.
18-sept-09	C Tieken	1.0	Revised version of ET manual

The Eurotransplant Manual contains the rules and regulations for the implementation and specification of national legislation and national guidelines for waiting list management, organ procurement and allocation. It has been prepared with the best of knowledge and the utmost care. In case of discrepancies between the content of this manual and national binding provisions, the following applies:

- Insofar, as provisions about the acceptance of organ recipients to the waiting list are concerned, this manual has only an informative character. Only the national provisions which are applicable for the transplant centers are relevant and legally binding.
- For the allocation of organs only the national provisions are legally binding. The display of the allocation provisions in this Manual are based on these legally binding national provisions. As far as necessary, they have been specified by Eurotransplant in this Manual. Deviations from such specifying Eurotransplant provisions cannot be considered as a breach of the national provisions as long as the latter are not violated. Eurotransplant cannot be held liable for a potentially wrongful description in this Manual of procedures, in connection with the organ allocation, as long as the actual allocation follows national provisions.

This Manual is property of Eurotransplant. Reproduction of the Manual, in whole or part, is only permitted with prior permission of Eurotransplant.

8.1	EIAS - URGENCIES.....	5
8.1.1	High Urgency (HU)	5
8.1.1.1	HU intestine audit	6
8.1.2	Approved Combined Organ (ACO).....	6
8.1.2.1	ACO audit	7
8.1.3	Transplantable (T), elective pediatric patient	7
8.1.4	Transplantable (T), elective adult patient	7
8.1.5	Not Transplantable (NT).....	8
8.2	EIAS GENERAL	9
8.2.1	ENIS allocation profile	9
8.2.2	The composition of an intestine graft	10
8.2.3	General waiting time counter	10
8.2.4	Urgency-specific waiting timer counters HU/ACO	10
8.2.5	Pediatric age definition and status.....	10
8.2.6	ABO blood group rules.....	11
8.2.6.1	Pediatric donor (<46 kg)	11
8.2.6.1.1	HU pediatric (Full ABO compatibility)	11
8.2.6.1.2	HU adult (Full ABO compatibility)	11
8.2.6.2	Approved combined organ (ACO)	11
8.2.6.2.1	ACO pediatric (Full ABO compatibility).....	11
8.2.6.2.2	ACO adult (Full ABO compatibility).....	11
8.2.6.3	Transplantable (T)	12
8.2.6.4	Adult donor (≥46 kg).....	12
8.2.6.4.1	HU adult & pediatric (Full ABO compatibility)	12
8.2.6.4.2	ACO adult & pediatric (Full ABO compatibility).....	12
8.2.6.5	Transplantable (T)	13
8.2.7	Virtual cross match	13
8.2.8	Donor criteria	14
8.2.9	Allocation sequence	14
8.2.10	Kidney after other organ bonus.....	14
8.2.11	Requirements of the tool kit.....	14
8.2.12	Follow up registry	15
8.3	EIAS – ALLOCATION ALGORITHM	16
8.3.1	Allocation algorithm pediatric donor (<46 kg)	16
8.3.2	Allocation algorithm adult donor (≥46 kg).....	16
8.4	FORMS	18

8.1 EIAS - Urgencies

Urgency codes are used to classify patients on the waiting list and to prioritize the patients in the match and allocation procedure. Urgency codes reflect transplantability and medical urgency.

Urgency codes			
Medical Urgency		Transplantable	Medical urgency
HU	High Urgency	yes	mandatory exchange
ACO	Approved Combined Organ	yes	mandatory exchange
T	Transplantable	yes	elective
NT	Temporarily not transplantable	no	no

8.1.1 High Urgency (HU)

A patient with HU status is prioritized over patients with ACO and Transplantable status on the intestine match and receives international priority. In case of a pediatric donor, pediatric patients with the HU status are prioritized over adult patients with an HU status. Within the constraints of the current ABO blood group rules and specific pediatric/adult/combined tier, HU patients are only ranked according to the date and time of assignment of the urgency HU. The Specific HU status allocation profile is applicable.

The HU intestine status is valid until transplantation or until the patient is placed on status Not Transplantable (NT).

Acceptance and transplantation of an intestine graft for a patient with the HU intestine status does not result in an obligation to the country of donation.

HU intestine cases will be discussed within the intestine auditor group on a regular basis.

HU intestine criteria:

In case only one or no standard venous access possibility remains (appropriate documentation needs to be provided) a HU intestine status can be requested for isolated intestine transplantation, intestine and kidney transplantation or modified multivisceral transplantations after audit by 2 intestine auditors outside of the requesting country.²

HU liver special cases concerning intestine

HU liver request in case of impending intestinal failure in a patient on the liver waiting list *In case a timely liver transplantation is expected to avoid the necessity of an intestine transplantation, HU liver status can be granted after audit by the ELIAC in which the advice of the intestine auditor group will be obtained. The advice of the intestine audit group will be sent to the ELIAC for information³.*

HU liver request for recipients also in need of intestine
HU liver status can be granted to recipients in need of transplantation of combined

² R-LAC03.16 Intestine – HU intestine status, implemented September 12, 2023

³ R-LAC05.16 Intestine – HU liver request in case of impending intestinal failure in a patient on the liver waiting list, implemented September 12, 2023

intestine and liver grafts or multivisceral grafts (including liver and intestine) in case of documented diffuse necrosis of one or more of these organs (due to vascular thrombosis) after audit by the ELIAC (of which one intestine auditor):

The above 2 special cases for HU liver concerning intestine are prioritized via the liver allocation, see also the ELAS Manual chapter 5 and the HU liver form on the [member site](#).

8.1.1.1 HU intestine audit

Each Eurotransplant member country is requested to appoint an expert in the field of intestine transplantation to take place in the HU intestine audit procedure⁵.

The HU intestine status can be requested between 08:00 and 23:00 hours daily (also during the weekend)

Two intestine auditors will be contacted to audit the request. Both intestine auditors must be from outside the requesting country and will be given 24 hours to reach a decision. In case of a split-decision, a third intestine auditor will decide on the approval or denial of the HU intestine request.

The corresponding HU Intestine form (see the [member site](#)) must be completed on all items, with complete and appropriate documentation and justification in the English language, and is then to be sent back to the ET duty desk.

To ensure independent decision-making by the auditors, auditor names should not be disclosed to the requesting center and other auditors involved. No auditor names should be made known to national competent authorities.

A remote center cannot assign urgency HU in ENIS.

In case a center has entered in ENIS that they have no capacity for transplantation, HU patients will still receive the offer.

8.1.2 Approved Combined Organ (ACO)

Patients in need of a multi-organ intestine transplant -except intestine+kidney- can be assigned with status ACO.

A patient with ACO status is prioritized over patients with the Transplantable status on the intestine match, and below the patients with HU status and receives international priority. In case of a pediatric donor, pediatric patients with the ACO status are prioritized over adult patients with an ACO status.

Within the constraints of current ABO blood group rules and specific pediatric/adult/combined tier, ACO patients are only ranked according to the date and time of assignment of the urgency ACO.

The ACO status is valid until transplantation or until the patient is placed on status Not Transplantable (NT).

Acceptance and transplantation of an intestine graft for a patient with the ACO intestine+pancreas status does not result in an obligation to the country of donation.

4 R-LAC06.16 Intestine – HU liver request for recipients also in need of intestine, implemented September 12, 2023

5 P-LAC02.16 Intestine – Audit procedure for intestine High Urgency status, implemented September 12, 2023

A remote center cannot assign status ACO in ENIS.

Should specific requirements be necessary other than available in the allocation profile, please contact the Eurotransplant Helpdesk to discuss the possibilities.

8.1.2.1 ACO audit

The corresponding ACO forms (see Forms at [the Eurotransplant member site](#)) must be completed on all items with a complete and appropriate documentation and justification written in the English language and has to be sent back to the ET duty desk.

In case of an ACO request for multivisceral transplantations or modified multivisceral transplantations (including intestine and pancreas), where the pancreas is requested for anatomical reasons, a request with justification regarding the need of the pancreas has to be included. The request will be reviewed by 2 auditors from ELIAC, of which one intestine auditor. In case of split decision an intestine specialist from the intestine auditor group will be asked as third auditor. Notification will be made to EPAC.

In case of ACO for multivisceral transplantations or modified multivisceral transplantations (including intestine and pancreas) with need of the pancreas for endocrine reasons an audit by ELIAC (of which one intestine auditor) and by EPAC will be made⁶. In case of a split decision, a third member will decide on the approval or denial of the ACO request.

In case of an ACO request including another organ, the auditor of that corresponding organ will be involved.

All auditors must be from outside the requesting country and will be given 24 hours to reach a decision.

A remote center cannot assign status ACO in ENIS.

In case a center has entered in ENIS that they have no capacity for transplantation, ACO patients will still receive the offer.

8.1.3 Transplantable (T), elective pediatric patient

Urgency code T is used for patients awaiting an intestine transplant and who are transplantable.

Patients listed on the intestine waiting list below 16 years of age will be regarded as a pediatric patient, regardless of their age at time of the intestine offer. These patients will receive the pediatric status and will be prioritized over adults in case of a pediatric donor.

Within the constraints of current ABO blood group rules, pediatric tier (in case of a pediatric donor) or pediatric and adult combined tier (in case of an adult donor), elective (T) pediatric recipients are ranked on the waiting list according to their total waiting time.

A primary diagnosis list for the intestine waiting list⁷ can be found on the [member site](#).

8.1.4 Transplantable (T), elective adult patient

6 R -LAC07.16 Intestine – ACO status request including pancreas for anatomical reasons, implemented September 12, 2023
7 P-LAC17.16 Intestine – Diagnosis list for intestine waiting list registration, implemented September 12, 2023

Urgency code T is used for patients awaiting an intestine transplant and who are transplantable.

Patients listed on the intestine waiting list at the age of 16 or later will be regarded as an adult patient.

Within the constraints of current ABO blood group rules and specific adult or pediatric and adult combined tier, elective (T) adult patients are only ranked according to the date and time of assignment of the urgency ACO.

A primary diagnosis list for the intestine waiting list⁸ can be found on the [member site](#).

8.1.5 Not Transplantable (NT)

Patients temporarily not transplantable should be placed in urgency NT. All previously accumulated waiting time is retained in NT.

8.2 EIAS General

Selection and ranking of patients is based on medical urgency, AB0 blood group rules, donor weight, recipient age, ENIS allocation profile, waiting time and donor location.

8.2.1 ENIS allocation profile

A transplant center must specify an ENIS patient-specific allocation profile for each recipient.

The intestine allocation profile contains no center specific allocation profile, only a patient-specific allocation profile. Entry of the patient-specific allocation profile is therefore mandatory.

It is the transplant center's responsibility to update the profile depending on the recipient's requirements at all times.

The patient-specific allocation profile includes (besides the standard items) the items:

- Age,
- Weight,
- BMI,
- ICU stay in days,
- Maximum serum-sodium in mmol/l (most recent value),
- Preference for AB0-identical offers only or AB0-compatible offers⁹

For patients with the HU intestine status the allocation profile items age and weight will remain applicable. All other profile items will not be taken into account in the HU intestine status.

For specification of any additional required visceral grafts, see 8.2.2.

For any other requirements an 'allocation comment' and a 'waiting list comment' are available. For information see Eurotransplant Manual Chapter 3 Allocation, paragraph Comments for allocation.

For further information on the patient-specific allocation profile, please refer to the [ENIS Next manual](#)

⁹ P-LAC09.16 Intestine – Blood group preference in intestine offers

8.2.2 The composition of an intestine graft¹⁰

The composition of an intestine graft for intestine transplantation includes small bowel, right hemicolon and abdominal fascia.

A multivisceral graft includes stomach, duodenum, pancreas*, liver*, small bowel, right hemicolon and abdominal fascia.

So does the modified multivisceral graft, however without the liver¹¹.

*Registration on the waiting list for each organ must be done according to the respective rules.

In order to facilitate communication between the Eurotransplant duty officer and the donor center, the specifications of the required additional visceral grafts must be provided in the ENIS next wait list screen. Available options to tick are:

- Right hemicolon
- Abdominal fascia
- Stomach
- Duodenum
- Abdominal wall

In case of an intestine donor, consent for the procurement of abdominal wall for intestine transplantation is mandatory¹² Also for other required additional visceral graft consent should be obtained.

8.2.3 General waiting time counter

After registration of a recipient in an active urgency, the general waiting time counter starts. Every day spent in any active urgency (HU, ACO or T) counts towards the general waiting time; waiting time is counted in days and is not limited. General waiting time is retained in the NT status and does not accumulate further.

8.2.4 Urgency-specific waiting timer counters HU/ACO

Urgency HU and status ACO have an urgency-specific waiting time counter. Waiting time is counted starting on the most recent date of the start of the current HU/ACO period. The longest waiting HU/ACO patient is ranked first within the urgency-specific group.

8.2.5 Pediatric age definition and status

Children registered on the intestine waiting list before the age of 16 are considered pediatric patients in the intestine allocation scheme and will be prioritized in case of pediatric donors. Patients listed before the 16th birthday will maintain this pediatric status until delisting.

In the German Richtlinie, the pediatric age definition is set to 18 years of age. However, on the intestine allocation scheme, the cut off of 16 years of age is used.

¹⁰ R-LAC12.16 Intestine – composition of the intestine graft, implemented September 12, 2023

¹¹ The small bowel contained allografts: existing and proposed nomenclature. Abu-Elmagd KM. Am J Transplant. 2011 Jan;11(1):184-5

¹² R-LAC13.16 Intestine – Abdominal wall, implemented September 12, 2023

8.2.6 AB0 blood group rules

AB0-incompatible intestine transplants are not allowed.

8.2.6.1 Pediatric donor (<46 kg)

8.2.6.1.1 HU pediatric (Full ABO compatibility)

Donor blood group	Eligible patients
A	A and AB
B	B and AB
AB	AB
O	A, B, AB and O

8.2.6.1.2 HU adult (Full ABO compatibility)

Donor blood group	Eligible patients
A	A and AB
B	B and AB
AB	AB
O	A, B, AB and O

8.2.6.2 Approved combined organ (ACO)

8.2.6.2.1 ACO pediatric (Full ABO compatibility)

Donor blood group	Eligible patients
A	A and AB
B	B and AB
AB	AB
O	A, B, AB and O

8.2.6.2.2 ACO adult (Full ABO compatibility)

Donor blood group	Eligible patients
A	A and AB
B	B and AB
AB	AB
O	A, B, AB and O

8.2.6.3 Transplantable (T)

ABO identical

Donor blood group	Eligible patients
A	A
B	B
AB	AB
O	O

before full ABO compatible.

Donor blood group	Eligible patients
A	A and AB
B	B and AB
AB	AB
O	A, B, AB and O

8.2.6.4 Adult donor (≥ 46 kg)

8.2.6.4.1 HU adult & pediatric (Full ABO compatibility)

Donor blood group	Eligible patients
A	A and AB
B	B and AB
AB	AB
O	A, B, AB and O

8.2.6.4.2 ACO adult & pediatric (Full ABO compatibility)

Donor blood group	Eligible patients
A	A and AB
B	B and AB
AB	AB
O	A, B, AB and O

8.2.6.5 Transplantable (T)

ABO identical

Donor blood group	Eligible patients
A	A
B	B
AB	AB
O	O

before full ABO compatible.

Donor blood group	Eligible patients
A	A and AB
B	B and AB
AB	AB
O	A, B, AB and O

8.2.7 Virtual cross match

The virtual cross match (vXM) will exclude intestine patients from the intestine match with unacceptables for specific antigens at allele-level, including their corresponding split and broad antigens. The unacceptable antigens can be entered in the ENIS application. No donor cross match will be performed in the donor hospital.

For German patients, the performance of a virtual cross match is mandatory, therefore the unacceptable antigens must be entered in the ENIS application¹³.

For non-German patients, the virtual cross match and thus entering the unacceptable antigens is not mandatory yet but highly recommended¹⁴.

Not entering patient unacceptable antigens can result in a positive subsequent transplant crossmatch.

Any transplant center can organize transplant cross matches at their own discretion.

As the donor HLA is essential for the vXM, the match cannot be generated with a pending donor HLA.

¹³ See Richtlinie Dünndarm

¹⁴ Advice from the intestine auditor working group on June 21, 2023. A recommendation is pending.

8.2.8 Donor criteria

The following criteria serve as guidelines for donor selection¹⁵:

- Age ≤50 years;
- Duration of intensive care ≤ 7 days;
- BMI ≤ 28;
- Most recent serum Sodium <155 mmol/l (at time of donor reporting).

The patient-specific allocation profile items (see 8.2.1) should be set as deemed applicable per patient.

8.2.9 Allocation sequence

If from one donor both pancreas and intestine are reported to ET, the intestine will always be allocated first. In case of an adult donor, the intestine and pancreas should always be offered both (if both organs were reported to ET). Every effort should be made to prevent loss of the pancreas for anatomical/surgical and/or logistical reasons¹⁶.

The accepting teams will be put in contact with each other.

In case at procurement of both intestine and pancreas proper procurement of both organs is not possible, the intestine graft has priority. In such cases a report is sent to ELIAC and to EPAC by the procuring surgeon¹⁷.

8.2.10 Kidney after other organ bonus

In addition to the option of performing a simultaneous intestine-kidney transplant the option of transplanting the intestine first and the kidney at a later time (i.e. a kidney-after intestine transplant) is possible in selected cases. Bonus points for the kidney waiting list can be obtained.

More details can be found in the Kidney manual.

8.2.11 Requirements of the tool kit

In case extra vessels are required that are normally procured along with the pancreas, An ACO status needs to be requested with the option 'pancreas for anatomical reasons'. See also 8.1.2 ACO status.

With regard to the toolkit the minimum of standard vessels in the toolkit in case of separate transplantation of liver, pancreas and intestine for transplantation should be:

- Intestine: iliac vessels (artery and vein) and bifurcation
- Pancreas: iliac vessels (artery and vein) and bifurcation
- Liver: common hepatic artery, celiac trunk
- Cannulation in the donor should be done at the level of the aorta

In case all three organs are going to be procured the liver center has to be informed about the limitation in the toolkit at time of acceptance¹⁸.

The accepting teams will be put in contact with each other.

¹⁵ P-LAC11.16 Intestine donor profile, implemented September 12, 2023

¹⁶ Recommendation R-LAC02.09

¹⁷ Policy P-LAC08.16, result of the Eurotransplant Intestine Allocation Consensus Meeting June 22, 2016

¹⁸ Policy P-LAC10.16, result of the Eurotransplant Intestine Allocation Consensus Meeting June 22, 2016

8.2.12 Follow up registry

There is no registry application in place yet for intestinal transplants. Graft function and follow up items¹⁹ have been defined and will be included in the future follow up registry.

Definition of graft function²⁰:

- 1) full function
- 2) requirement of fluid / micronutrient substitution (Partial function)
- 3) complete TPN depending (non-function; graft loss, persistence of chronic intestinal failure)

For now, minimal follow up-items can be filled in the Transplant screen in ENIS next.

¹⁹ P-LAC18.16 Intestine - Registry follow up items
²⁰ P-LAC16.16 - Intestine - Definition of graft function

8.3 EIAS – allocation algorithm

8.3.1 Allocation algorithm pediatric donor (<46 kg)

Donor < 46 kg²¹

A donor less than 46 kg will be regarded as a pediatric donor. Recipients listed below 16 years of age will be regarded as a pediatric recipient, regardless of their age at time of the intestine offer.

First, to pediatric HU patients (Full ABO compatibility)
(if > 1 HU patient, they appear in order of waiting time in HU)

Then, to adult HU patients (Full ABO compatibility)
(if > 1 HU patient, they appear in order of waiting time in HU)

Then, to pediatric ACO multi-organ patients (Full ABO compatibility)
(if > 1 ACO patient, they appear in order of waiting time in ACO)

Then, to adult ACO multi-organ patients (Full ABO compatibility)
(if > 1 ACO patient, they appear in order of waiting time in ACO)

Then, to pediatric recipients in the donor country, (AB0-identical before AB0-compatible, then according to waiting time).

Then, to pediatric recipients in the other ET countries,
(AB0-identical before AB0-compatible, then according to waiting time).

Then, to adult recipients in the donor country,
(AB0-identical before AB0-compatible, then according to waiting time).

Then, to adult recipients in the other ET countries,
(AB0-identical before AB0-compatible, then according to waiting time).

8.3.2 Allocation algorithm adult donor (≥46 kg)

Donor ≥ 46 kg

First, to HU intestine (adult & pediatric) (Full ABO compatibility)
(if ≥ 1 HU intestine patient, they appear in order of waiting time in HU status)

Then, to ACO patients (pediatric & adult) (Full ABO compatibility)
(if ≥ 1 ACO patient, they appear in order of waiting time in ACO).

Then, to elective T patients (pediatric & adult) in the donor country, AB0-identical before AB0-compatible, then ranked by waiting time.

²¹ R-LAC04.16 Intestine – Intestine allocation scheme, implemented September 12, 2023

Then, to elective T patients (pediatric & adult) in the other ET countries, ABO-identical before ABO-compatible, then ranked by waiting time.

8.4 Forms

All forms can be found and downloaded from the section 'Forms' of the member site at <https://my.eurotransplant.org/>