Annotation Guide - GAVROCHE project

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PART I. GENERALITIES ON ANNOTATION

1. Introduction

The annotation is the association of an information with a textual sequence, or more simply to a sentence segment.

An annotation is defined by a category (or type) that lists all possible textual sequences for that category.

The objective of the annotation is, in the first instance, to build up resources in order to teach a machine to read the reports automatically and extract the relevant information. For example, answering the question "Does the patient have a history of myocardial infarction?" when reading a report. Secondly, the annotation is used to evaluate the relevance of the information extracted by the machine. For example, in a sample of reports, we will identify the proportion for which the machine would have answered this question correctly (or at least as experts stated it to be correct).

The purpose of this annotation guide is to detail the annotation categories and rules to be followed when annotating hospital reports in the GAVROCHE project, in order to obtain the most homogeneous annotation practice possible between centers.

If you have any questions about this guide or the annotation process, please contact

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- Dr Matthieu WARGNY, co-PI of the GAVROCHE project
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2. Reminder of how to obtain HRs (hospital reports) processed for the training phase

We sampled, over the period 2011-2019 and in the Nantes University Hospital PMSI, all HRs associated, with an ICD-10 code for acute heart failure (aHF) and/or an GHM code for aHF.

3. Reminder of the final classification procedure of the hospitalization in GAVROCHE

A patient may be hospitalized several times. The question of hospitalization for aHF is dealt with only on the basis of information gathered from the HRs associated with this hospitalization.

A single hospitalization can be associated with several HRs, and a single HR can have several annotations. It is important to note that these annotations can be contradictory, with differences between the HRs of the same hospitalization, but also differences between the annotations within the same HR. In practice, for the question of the diagnosis of includible/not includible aHF , we will reason at the hospitalization:

- If ≥ 1 HR is labeled "INCLUDIBLE," then the hospitalization is labeled "INCLUDIBLE", regardless of the other labels

- Other configurations will result in the non-inclusion of the patient, and the distribution of labels will be quantified (% NOT INCLUDIBLE, % UNCERTAIN, % mixed)

4. Annotation rules

This guide proposes a common framework for annotations and provides examples from hospital reports.

- Annotated portions are generally noun phrases excluding prepositions. Initial articles are excluded from annotated portions. For example, we will annotate
    - the patient has type 2 diabetes
    - rather than the patient has type 2 diabetes
- The annotated portions for the modalities for which the searched value is numerical contain the text range corresponding to the searched value as well as the unit if it is mentioned. For example, we will annotate
    - "52 kg weight"
    - Rather than "52 kg weight"

5. Annotation groups

In order to facilitate your annotation process, we have divided the different modalities to be annotated in 6 large groups:

- **Group 0** indicates whether the hospitalization is related to acute heart failure and the date of patient's admission to the hospital.
- **Group 1** addresses the usual drug therapy prior to admission, and the cause of heart failure decompensation, if known.
- **Group 2** addresses cardiovascular history: aHF (for acute heart failure), myocardial infarction, other coronary artery disease, stroke, CHF (for chronic heart failure), and the cause of chronic heart failure, if known.
- **Group 3** addresses respiratory history and diabetes: hypertension, chronic obstructive pulmonary disease (COPD), sleep apnea syndrome, diabetes and diabetes type if applicable.
- **Group 4** addresses various clinical information at admission: weight, height, BMI, blood pressure, heart rate, and last smoking status.
- **Group 5** addresses history of AF (for atrial fibrillation) and LVEF (for left ventricular ejection fraction).

PART II – Group 0 aHF classification

GROUP 0 aHF classification - Eligibility ± admission date (4 modalities)		
N°	**Variable (number of modalities)**	**Modality (full name in the annotation tool)**
1	INCLUDIBLE_AHF (1/3)	INCLUDIBLE_AHF
2	INCLUDIBLE_AHF (2/3)	NOT_INCLUDIBLE
3	INCLUDIBLE_AHF (3/3)	INCLUSION_AHF_UNCERTAIN
4	DATE_ADMISSION	DATE_ADMISSION

Modalities: not includible / includible / uncertain

These 3 modalities aim to define whether, on reading the report, the patient is indeed includible in the GAVROCHE study on the criterion "hospitalization related to acute heart failure".

To be includible, acute heart failure must have been the cause of the hospitalization or present on the patient's admission. In particular:

- if aHF is not present on admission but appears secondarily, for example after 2 days of hospitalization, the patient is not includible
- if aHF is not the primary cause of hospitalization, but was present at admission, then the patient is considered to be includible

For note:

- Other eligibility criteria of the GAVROCHE study, independent of the aHF (e.g. age of the patient, blood glucose measurement...) are not evaluated here.
- The annotation "patient not includible" should refer to the idea that the patient does not have aHF, not just a differential diagnosis. For example, "hospitalization for COPD" does not imply that the patient is not admitted with aHF

It can happen that, in the same report, two information are contradictory, one indicating aHF and others going against this diagnosis (no sign of heart failure on examination). **In this case, it is requested to annotate the two segments of information, even if they are contradictory**

1. aHF: “INCLUDIBLE”

- Probable heart failure
- Acute pulmonary edema, sub-OAP (except, in particular, if considered as purely nephrogenic)
- Cardiac decompensation, including “*a minima*”
- Hospitalization for other causes but noted as "minimal heart failure flare"
- Bronchitis associated with a left ventricular failure
- Progressive heart failure decompensated at home (rather subacute but accepted)
- Signs of cardiac decompensation on admission
- Tako tsubo cardiomyopathy
- Pulmonary hypertension decompensation with right signs (even without mention of heart failure)

- Cardiogenic shock (any)
- Cardiac asthma
- Hyperkalemia at home => resuscitated RTA on admission => aHF on discharge
- Inaugural RTA, other cause, then pulmonary edema on immediate follow-up
- Biventricular failure
- Cardio-renal syndrome
- Inaugural aHF but transferred from another UHC: to be classified as "INCLUDIBLE", even if the patient will not be kept in the final analysis because of the transfer

Examples of annotation:

- Global cardiac decompensation
- presented in a few days a dyspnea of progressive aggravation associated with oedemas of the lower limbs

2. aHF: “NOT INCLUDIBLE”

- Pre-transplant check-ups
- **Percutaneous aortic valve replacement** (**PAVR**) staff meeting
- Post-operative follow-up: **PAVR**, Bentall surgery, femoral fracture, heart transplantation, CARMAT artificial heart, HeartWare, gastrostomy, by-pass
- Various follow-ups: heart transplantation, CARMAT artificial heart, valvulopathy, non-decompensated heart failure, telemetry, HeartWare circulatory assistance follow-up
- Any Day Hospitalization (DH), **except for** heart failure observed during the DH and leading to hospitalization of the patient
- Complex cases: aHF noted in the conclusion but, on rereading the HR, clearly absent during hospitalization. For example: "aHF episode during hospitalization" or "marked evolution by pulmonary edema".
- “Advanced heart failure” (DH cardio)
- Infectious pneumonia labeled but no argument for aHF/pulmonary edema
- Edema (almost hydrops) without pulmonary overload
- Respiratory arrest on mucous plug with left heart decompensation later during hospital stay
- Geriatric assessment report in which it is found that the patient had a post-interventional pulmonary edema after a PACR of the present hospitalization --> the aHF occurs during the present hospitalization but following an intervention, so it is considered as secondary

Examples of annotation:

- Septic shock of unknown origin, without microbiological identification
- The summary of the stay in the ER is as follows: Bilateral oxygen-dependent pneumonia without signs of severity
- CONCLUSION: Externalized digestive hemorrhage in the form of melena and hematemesis, complicated by hemorrhagic shock

3. aHF: “UNCERTAIN”

- Doubt / suspicion of heart failure
- Sodium retention in the context of end-stage renal failure (dialysis), without any sign of heart failure or shock, edema of undetermined origin
- Signs of heart failure at entry but never clearly diagnosed
- Pulmonary hypertension mentioned alone, without signs of HF
- Increased dyspnea on mild pulmonary decompensation
- Infectious pneumonia and bronchodilatation, doubtful in front of "not really lower limb edema" "fibrosis crackles", no explicit diagnosis of aHF or pulmonary edema
- Initial suspicion of pulmonary edema but slow increase under furosemide + restrictive pneumonia terrain described
- Patient with no evidence of heart failure but elevated NT-proBNP and "patient subjective improvement" on furosemide prior to death
- Dyspnea + "no evidence of CHF on examination" + BNP 3000 attributed to congestive HF but no diagnosis of dyspnea
- (verbatim from 95 year-old patient): "no sign of CHF" then "left ventricular failure on ACS with decreased ST segment" and then "home discharge".
- Acute dyspnea in a context of heavy cardiorespiratory comorbidities
- "Super-emergency heart transplantation" (sic)
- patient known for severe heart failure admitted in DH for monitoring. On admission, only hypokalemia and "congestive signs" were mentioned, with a clear rise in NT-proBNP
- Post-op PAVR surveillance report in which it is mentioned that the patient was admitted on a semi-emergency basis to receive rapid PAVR, but the diagnosis of aHF and the clinical signs are not mentioned in the file
- Cardiac decompensation mentioned in the reason for admission but not found in the finding and the admission exam describes an "absence of signs of heart failure"
- Pulmonary edema in a purely renal context, without an obvious cardiac component (e.g., nephrogenic pulmonary edema with no indication of heart failure)

For note, clinical signs of heart failure whose annotation is to be discussed

- Dyspnea, crackles
- Edema of the lower limbs, jugular turgescence, hepatojugular reflux
- Increased NT-proBNP, effectiveness of furosemide

4. Date of admission

The precise date of the patient's admission should be annotated, i.e. the day of his or her arrival at the hospital (and therefore not a possible previous admission to another hospital => limit of transfers), whether he or she arrived via the emergency room, directly in an inpatient department or, more rarely, whether a simple consultation or a DH finally led to his or her hospitalization.

For note: the date of admission will only be requested in Nantes

Examples of annotation:

- was hospitalized in our department from February 3, 2015 to
- March 23 to April 4, 2014

PART III – GROUP 1

GROUP 1 - Treatment, triggering factor, cardiac arrest (11 modalities)		
N°	**Variable (number of modalities)**	**Modality (full name in the annotation tool)**
1	TF_HF (1/6)	TF_aHF_tb_of_rhythm
2	TF_HF (2/6)	TF_aHF_ischemic
3	TF_HF (3/6)	TF_aHF_HTA
4	TF_HF (4/6)	TF_aHF_infectious
5	TF_HF (5/6)	TF_aHF_regime_treatment
6	TF_HF (6/6)	TF_aHF_other_or_unknown
7	USUAL_TREATMENT	TTT_USUAL
8	ADM_CARDIAC_ARREST	ADM_CARDIAC_ARREST_YES

1. Triggering factors for aHF

Desired information: is the triggering factor(s) for aHF known? This information can be collected through 6 modalities, not mutually exclusive (several can be indicated):

- Heart rhythm disorder (any kind)
- Myocardial ischemia
- High blood pressure flare-up (including if secondary to other factors)
- Infectious
- Changes in diet (e.g., excessive salt intake) or medication (e.g., stopping diuretics)
- Other or unknown: to be specified when an explicit cause of decompensation does not fit in the previous modalities or when the cause of the aHF is not known and this is explicitly mentioned, e.g.: "Cardiac decompensation of unidentified cause".

Special cases

- Background of atrial fibrillation (AF) on CORDARONE stop
    - Annotated as AF rhythm disorder AND as AF diet/treatment

- Expression “as part of” or “in a context of”
    - not enough to be considered as a triggering factor, often corresponds to the "terrain" of comorbidity rather than a triggering factor (calcified aortic stenosis, ischemic heart disease...) => not systematically annotated.

- Case of uncertainties
    - Triggering factor "probably" infectious: retained as infectious
    - "after an infectious episode": retained as infectious triggering factor, even if doubtful

Examples of annotation:

- Myocardial ischemic:
    - global cardiac decompensation due to ischemic heart disease
- Diet modification:

    - Triggering factor of acute alcoholization on chronic alcoholization.
    - global cardiac decompensation on possible cardiopathy secondary to chemotherapy treatment
- Other or unknown:
    - No triggering factor
    - was hospitalized on our service from December 26 to 30, 2014, for anemia at 7.2 g/dL.
    - the patient initially shows signs of left heart failure secondary to the transfusion.
    - Iatrogenic left heart decompensation with a favorable outcome
    - No triggering factor found on examination.

2. Usual treatment

The purpose of this item is to select all of the patient's usual medications just prior to admission. If these medications are described in a single paragraph or in a series of bullet point, it is perfectly possible to annotate them all at once. One annotation can therefore cover several drugs (see example).

- Annotated
    - Usual treatment at entry
    - Including "recently started" (including antibiotics started the day before)
    - Recently stopped / If needed / On request: annotate these elements (post-processing possible with NLP)

- Not annotated
    - Exit treatment: none is taken into account
    - If treatment is specified in Geriatric HR but not specified "at admission": not annotated, as it is not known if treatment was not started during hospitalization

Example of annotation:

- HABITUAL TREATMENT: TEMERIT 5 mg (1 in the morning), TAHOR 10 (1 in the evening),

3. Cardiac arrest on admission

Desired information: Was the patient in cardiopulmonary arrest when the rescuers arrived, and/or did he/she present a cardiopulmonary arrest during transfer to the UHC and/or the emergency room?

PART IV – GROUP 2 Cardiovascular history

GROUP 2 - Cardiovascular history (9 modalities)		
N°	**Variable (number of modalities)**	**Modality (full name in the annotation tool)**
1	CORONARY_excluding_MI	CORONARY_excluding_MI
2	MI	MI
3	STROKE_TIA	STROKE_TIA
4	aHF	aHF
5	CHF	CHF
6	CHF_cause (1/4)	CHF_VALVE
7	CHF_cause (2/4)	CHF_ISCHEMIC
8	CHF_cause (3/4)	CHF_HYPERTENSION
9	CHF_cause (4/4)	CHF_NK_MIXED_OTHER

1. History of coronary disease other than MI

Desired information: is the patient already known to have coronary artery disease?

In particular, if coronary artery disease is discovered during the stay, it is not desirable to annotate it.

For note, coronary artery disease does not include a history of myocardial infarction, which is coded in the next item.

- Annotated
    - concept of coronary artery disease
    - positive scintigraphy (debatable...)
    - ischemic heart disease (unless considered as chronic IC...)
    - stable angina
    - unstable angina
    - angina pain

- Not annotated
    - Incipient atheroma on scintigraphy

Examples of annotation:

- double bypass on the left anterio descending (LAD) artery in 1994,
- His main history is ischemic heart disease
- underwent LAD and marginal bypass revascularization in 2009

2. History of myocardial infarction (MI)

Desired information: Has the patient ever had a myocardial infarction?

As a note, if the stay is related to an aHF secondary to an infarction, the MI is not annotated here as patient's history.

Example of annotation:

- Myocardial infarction in 1986

3. History of stroke or TIA (Transient Ischaemic attack)

Desired information: has the patient ever had a stroke?

For note: take a position on TIA.

- Annotated
    - TIAs
    - Right facial hemiparesis on left carotid stenosis

- Not annotated
    - carotid surgery or carotid damage

Example of annotation:

- Stroke on right carotid stenosis in 2010,

4. History of aHF

Desired information: Has the patient ever had acute heart failure before the current episode?

For note: this information may appear in the history, but also quite frequently in the description of the current episode ("new decompensation for aHF", for example).

- Annotated
    - New decompensation
    - New HF surge

Examples of annotation:

- was experiencing a new onset of heart failure.
- multiple cardiac decompensations since the beginning of the year.

5. History of chronic heart failure

Desired information: Has the patient ever had chronic heart failure?

- Annotated
    - Progressively worsening dyspnea for 6 months in early heart failure

    - Overall heart failure evolving over the past month
    - NYHA used to describe pre-hospital chronic condition (from stage II at least), unless very recent (a few days)
    - Tako-tsubo cardiomyopathy

- Still annotated but more questionable:
    - Dilated cardio(myo)pathy
    - heart disease
    - Any TTE prior to hospitalization noting severe hypokinesia or akinesia
    - "(current) hospitalization complicating heart disease"
    - Diastolic or systolic or ventricular dysfunction in history

- Not annotated but still to be discussed
    - "Increased edema in the emergency room (compared to chronic)"
    - TTE of hospitalization indicating severe dilated or hypertrophic cardiomyopathy
    - Impaired LVEF noted as history: not annotated because seen in another block? Rare case but big doubt

6. Cause of chronic heart failure

Desired information: is the triggering factor(s) for chronic heart failure known? This information can be collected through 4 modalities, not mutually exclusive (several can be indicated):

- Valvulopathy
- Ischemic
- High blood pressure flare-up (including if secondary to other factors)
- Infectious

Congestive HF (CHF) - ischemic

- Annotated
    - Cardiac decompensation in the setting of ischemic heart disease

Congestive (CHF)- valvulopathy

- Annotated
    - tight shrinkage
    - severe valvular insufficiency
    - Valve replacement
    - Considered valve surgery
    - Heart disease with aortic stenosis (questionable, especially since the same HER (electronic health record) states "no valvulopathy")
    - Any valve insufficiency rated stage or grade 3 or 4 (out of 4)

- Not annotated
    - Moderately tight valve
    - valvular heart disease on clinical mitral insufficiency (murmur)
    - Valve insufficiency or narrowing, SAI (no further information) or minimal or moderate: not annotated, rated as insufficient
    - Very calcified valve
    - IT with impaired RVEF (right ventricular ejection fraction) (questionable)

CHF - hypertension

- Annotated
    - Cardiac decompensation in the context of hypertension

CHF – not known / other / mixed

- "Mixed": annotated as such only if so stated in the EHR. If several causes are noted, they are annotated separately when possible. For example: "ischemic and valvular heart disease".

- Annotated
    - Rhythmic (AF +++)
    - dilated cardiomyopathy du to anthracyclines
    - Amyloidosis

- Not annotated
    - Unknown cause
    - Etiological workup indicated as not performed

PART V – GROUP 3 Respiratory History and Diabetes

GROUP 3 - Respiratory history and diabetes (7 modalities)		
N°	**Variable (number of modalities)**	**Modality (full name in the annotation tool)**
1	HYPERTENSION	HYPERTENSION_YES
2	COPD	COPD_YES
3	OSA	OSA_YES
4	NO_DIABETES	NO_DIABETES
5	DIABETE_TYPE1	DIABETES_type1
6	DIABETE_TYPE2	DIABETES_type2
7	DIABETE_OTHER	DIABETES_other

1. History of hypertension

Desired information: was the patient known to have hypertension (treated or not, balanced or not) before hospitalization?

For note:

- The presence of elevated blood pressure on entry is irrelevant here - do not annotate blood pressure measured in the HR, for example
- we are talking about arterial hypertension and not pulmonary arterial hypertension (PAH)
- Found almost exclusively in the form of hypertension and arterial hypertension, rarely "hypertensive" to refer to a complication
- Attention: anti-hypertension treatments are not used here (e.g. eupressyl, even if specific)

Examples of annotation:

- Cardiovascular risk factors: Hypertension, dyslipidemia
- CVRF: type 2 diabetes, hypertension

2. History of COPD

Desired information: does the patient have a history of chronic obstructive pulmonary disease?

For note: we will look here for the notion of this diagnosis, and not the construction of the diagnosis from medical elements (smoking and cough or chronic dyspnea, for example).

- So far, found mostly under "COPD".
- 1 case in 100 EHR with chronic lung disease
- "Probable COPD" annotated as COPD

3. History of obstructive sleep apnea(OSA)

Desired information: Has the patient been diagnosed with obstructive sleep apnea syndrome?

For note:

- a simple suspicion of OSA should not be annotated
- this information must be annotated regardless of the notion of equipment yes/no
- For the moment, found mainly in its literal form "apnea syndrome..."
- Also: “obstructive sleep syndrome”
- Do nothing with the information " OSA eliminated on nocturnal oximetry".
- 1 case of suspected OSA annotated as OSA (questionable+++)

Example of annotation:

- Sleep apnea syndrome with a device.

4. History of diabetes

Desired information: Is the patient known to have diabetes? This information can be collected through 4 modalities:

- No diabetes, if the absence of diabetes is affirmed (e.g., "no notion of diabetes")
- Type 1 diabetes: also if the diagnosis is explicit
- Type 2 diabetes: idem
- Diabetes other: if the type of diabetes is not explicitly written down, or if it is neither type 1 nor type 2 (e.g. secondary, MODY diabetes, etc.). This variable should therefore be understood as "neither type 1 nor 2 or unknown diabetes".

Warning

- Diabetes treatments are not exploited here, even if they are all specific (see group 1)
- "Type 2 diabetes complicated by diabetic nephropathy": 2 distinct elements annotated in the same sentence

Type 2 diabetes

- Annotated
    - Type 2 (or II) diabetes
    - Non-insulin-dependent diabetes (NIDDM)
    - Non-insulin-requiring diabetes (the objective being not to put this information on the same level as the notion of a diabetic complication)

Examples of annotation:

- Type 2 diabetes.
- CVRF: type 2 diabetes, hypertension,
- BACKGROUND: Type 2 diabetes since 2000,
- He is a type II diabetic,

Diabetes other

- Annotated
    - Insulin-dependent diabetes (IDD)
    - Insulin-requiring diabetes
    - Complication of diabetes: diabetic nephropathy, etc.
    - Diabetes without details
    - Diabetes on oral antidiabetic drugs (OADs) / antidiabetic drugs
    - HbA_{1c} value ≥ 6.5% reported
    - Diabetic diet
    - Untreated diabetes
    - Complications of diabetes

Examples of annotation:

- imbalance of a chronic disease (diabetes, multiple sclerosis,
- probable diabetic nephropathy

Part V – GROUP 4 Clinical on admission

GROUP 4 - Clinical information at admission and smoking status (8 modalities)		
N°	**Variable (number of modalities)**	**Modality (full name in the annotation tool)**
1	ADM_CLIN_HR	ADM_CLIN_HR
2	ADM_CLIN_BP	ADM_CLIN_BP
3	ADM_CLIN_weight	ADM_CLIN_weight
4	ADM_CLIN_height	ADM_CLIN_height
5	ADM_CLIN_BMI	ADM_CLIN_BMI
6	Smoking (1/3)	SMOKING_never
7	Smoking (2/3)	SMOKING_weaned
8	Smoking (3/3)	SMOKING_active

1. Heart rate

Desired information: what is the patient's first heart rate measured on admission? The precise time of measurement is often difficult to establish, but the first information during the taking over by the EMS or by the emergency room is admissible.

However, if the heart rate is carried over from another event during the hospitalization, it should not be annotated.

- ECG record also annotated if available
- AF case: "100 to 140" => will we take the highest value?

Examples of annotation:

- pulse at 94 ,
- heart rate at 78/min,
- HR: 77/min,
- sinus rhythm with 53 beats per minute.

2. Blood pressure

Desired information: what is the patient's first blood pressure measured on admission?

The annotation rule is similar to the one proposed for the admission heart rate (see above)

- False BP (54/83 mmHg): still annotated, will be corrected in post-processing

Examples of annotation:

- On arrival at the emergency room, the blood pressure is 130/70
- Clinical examination at entry: blood pressure 112/65,
- In the ER, BP: 121/58,
- CLINICAL EXAMINATION: TA: 12/9

3. Weight

Desired information: what is the patient's first weight measured on admission?

The annotation rule is similar to the one proposed for the admission heart rate (see above)

- Discharge weight at 96 kg and three kilos lost during hospitalization => annotated even if not admission weight?
- Escape from the context question (entry or exit): ultimately keep only the lowest weight during hospitalization? **(to be discussed)**
- To note: a case of weight increase between input and output

Example of annotation:

- Arrival weight: 58,7,

4. Height

Desired information: how tall is the patient?

All patients in the study are adults, so height can be annotated regardless of the temporality of the measurement (including before hospitalization, during or after).

For note: Rarely indicated

Example of annotation:

- Size: 175 cm

5. BMI

Desired information: what is the patient's first BMI measured on admission?

The annotation rule is similar to the one proposed for the admission heart rate (see above)

For note: Very rarely indicated

Examples of annotation:

- Obesity with a BMI at 35.
- obesity (BMI at 36).

6. Smoking status

Desired information: what is the patient's known smoking status during hospitalization? This information can be collected through 3 modalities:

- Never, if the patient has never smoked (or a few units of cigarettes in his or her life, and not recently)
- Active, if the patient was still smoking at the time of admission
- Weaned, if the patient has smoked regularly in the past but was not smoking at the time of admission

For note:

- Post-smoking COPD: does not involve weaning or active. What to do?
    - Proposal: not to take into account, COPD being a more interesting marker than smoking for our study **(to be discussed)**

Examples of annotation:

- Smoking: Never
    - No tobacco, no alcohol.
- Smoking: Active
    - active smoking at 7 cigarettes/day,
    - active smoking at 58 pack years,
    - continuing its intoxication alcoholic-smoker
- Smoking: Weaned
    - Post-smoking COPD weaned on electronic cigarette.
    - Smoking weaned for ten years, estimated at 40 packs/year.

Part VI – GROUP 5 arrhythmia/atrial fibrillation

BLOCK 5 - AF history and first LVEF (5 modalities)		
N°	**Variable (number of modalities)**	**Modality (full name)**
1	History_AF	HISTORY_AF_YES
2	Admission_AF	ADM_AF_YES
3	LVEF (1/3) (reduced)	FEVG_40
4	LVEF (2/3) (moderately reduced)	FEVG_41_49
5	LVEF (3/3) (preserved)	FEVG_50

1. History of arrhythmia/FA

Desired information: does the patient have a known history of cardiac arrhythmia/atrial fibrillation prior to hospitalization?

Annotated

- Chads-vasc
- Flutter
- If noted as "recently discovered": well considered as a history, except if the discovery is only associated with the current event (hospital, therefore)

Not annotated

- Atrial tachysystolia
- Notion of arrhythmia without further information

Examples of annotation:

- Paroxysmal AF
- Atrial fibrillation anticoagulated with MINI-SINTROM.

2. CA/FA on admission

Desired information: does the patient have a cardiac arrhythmia/atrial fibrillation on admission (e.g., to the place of rescue or emergency department)?

For note: AF can be raised, even if it is not permanent.

Annotated

- History of AF + irregular rhythm on admission = very likely AF on admission

Not annotated

- AF absent at admission but observed during the stay

Examples of annotation:

- The ECG shows a complete arrhythmia by atrial fibrillation
- pacemaker monitoring shows persistent AF
- The ECG shows an AF rhythm without repolarization disorder.

3. Left ventricular ejection fraction (LVEF)

Desired information: what is the value of the left ventricular ejection fraction assessed during hospitalization?

Only hospital LVEF should be annotated. The values can be expressed in % but also verbatim, e.g. "LVEF preserved". Both cases must be annotated, even if double annotation, example *"LVEF preserved (60%)".*

If several values are proposed in the same HR, take the highest LVEF value.

From the HRs, we often see the coding:

- Reduced if ≤ 40%.
- Altered = moderately reduced = 41-49
- Retained if ≥ 50%, included

Examples of annotation:

- Reduced (≤ 40%):
    - history of severe ischemic heart disease (LVEF 35%)
- Altered or moderately reduced (41-49%)
    - moderately impaired LVEF at 45-50%.
    - moderate systolic left ventricular dysfunction at LVEF 45%.
- Preserved or conserved (≥ 50%)
    - Heart failure with preserved LVEF
    - Cardiac ultrasound shows an LVEF of 58%.
    - LVEF 50