

Annotation Guidelines

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Contents

1	Introduction	3
2	Entities	3
2.1	General Guidelines for Entity Annotation	4
2.2	Drug	7
2.2.1	Triggers for Medication Status Changes	8
2.2.2	Attribute: Drug Changes	8
2.3	Disorder	9
2.3.1	Negation of Disorders	10
2.3.2	Partial Negation (of Disorders)	10
2.4	Function	11
2.4.1	Negation of Functions	11
2.5	Anatomy	11
2.6	Test	12
2.7	Opinion	12
2.7.1	Attribute: Sentiment	13
2.8	Measure	13
2.9	Time	14
2.9.1	Attribute: Temporality	14
2.10	Route	15
2.11	Doctor	15
2.12	Entities for De-Identification	15
2.13	Other	16
3	Relations	17
3.1	caused	18
3.1.1	Special Case: Effects of Stopping Medication Intake	19
3.2	treatment_for	19
3.3	has_dosage	20
3.4	experienced_in	20
3.5	examined_with	20
3.6	has_result	21
3.7	refers_to	21
3.8	interacted_with	21

3.9	signals_change_of	22
3.10	has_time	22
3.11	has_route	22
3.12	is_opinion_about	23
3.13	misc	23
4	Difficult Cases	23
4.1	Entailment	23
4.2	Advice from other Users	24
4.3	English	24
4.4	French	24
4.5	German	25
4.6	Japanese	25
4.6.1	Distinction of Disorder, Function, and Opinion for sentiment expressions	25
4.6.2	Disorder expressions using general words	25
4.6.3	Body weight changes with weight values	26

1 Introduction

In the following, we describe the annotation scheme we developed for our multi-lingual corpus KEEPHA. The data for this corpus consists of different sources, e.g., patient fora, social media like Twitter, [TBD](#). In Table 1, we give an overview of the current annotated documents, their origin and the language they are written in.

name	language	#documents	source	description
Lifeline-v1	German (de) French (fr)	4,169	www.lifeline.de	
lexapro_ade	Japanese (ja)	560	Twitter	
chiebukuro	Japanese (ja)	59	Yahoo! JAPAN Q&A	
Total	de, fr, ja			

Table 1: Overview of the current KEEPHA dataset.

Lifeline-v1 DESCRIPTION OF DATASET

french_data DESCRIPTION OF DATASET

lexapro_ade DESCRIPTION OF DATASET

chiebukuro DESCRIPTION OF DATASET

The annotation schema include entities, attributes and relations. First, we define the annotated entities (Section 2), including possible attributes. Moreover, together with each entity different examples of their usage are presented. Examples marked with * denote sentences which have been translated from a different language and sentences marked with ** denote ‘artificial’ examples, which have been completely made up. All other examples are real. Subsequently, we define the relations connecting these entities (Section 3). English examples are extracted from the CADEC corpus [CITATION](#), while German examples are taken from the Lifeline data (v1 and unlabeled data). The French examples are from AFA. Lastly, the Japanese examples are taken from social media (Twitter) and forum (Yahoo! JAPAN Q&A) posts.

You can toggle the translations of the non-English examples by clicking [here](#)¹:

[show/hide translations](#)

Note, sometimes the translated sentences do not perfectly fit the original translations of the target languages. However we keep the original annotation of the target language.

2 Entities

In Table 2, we show all available entities and their respective attributes. Attributes are used to add more precise semantics to some of the entity annotations.

¹this feature is unfortunately not supported by all PDF viewers

section	entity	attributes
2.2	drug _{drug}	increase, decrease, stopped, started, unique_dose
2.2.1	change trigger _{change_trigger}	
2.3	disorder _{disorder}	negated
2.4	function _{function}	negated
2.5	anatomy _{anatomy}	
2.6	test _{test}	
2.7	opinion _{opinion}	positive, negative, neutral
2.8	measure _{measure}	
2.9	time _{time}	frequency, duration, date, point
2.10	route _{route}	
2.11	doctor _{doctor}	
2.12	user _{user}	
2.12	url _{url}	
2.12	personal information _{perso.info}	
2.13	other _{other}	

Table 2: Overview of the entities and their attributes.

2.1 General Guidelines for Entity Annotation

We now define general rules for the annotation of entities.

Scope

Regarding scope, we annotate entities in form of noun or verb phrases together with their modifying parts, e.g. adjectives, adverbs etc., though complex post modifiers (e.g., relative clauses: “a pain that is ...”; and prepositional-phrase modifiers: “a neck pain from yesterday”) are excluded. We always prefer the smallest core noun phrase. If this does not work, a long span of the whole verb phrase (or even the whole clause/sentence) is allowed.

- (1) (en) I have **absolutely no appetite_{disorder}** and **constantly feel sick_{disorder}** to my **stomach_{anatomy}**.
- (fr) (...) ça fait **drolement mal_{disorder}** et **très gênant_{disorder}**.
*[It **hurts awfully_{disorder}**, and it is a **great discomfort_{disorder}**]*
- (de) (...) ich hatte in der Situation auch **absolut keinen Hunger_{disorder}**.
*[I was also **absolutely not hungry_{disorder}** in this situation.]*
- (ja) ** **激しい嘔吐_{disorder}** に見舞われました
*[I suffered **severe vomiting_{disorder}** .]*

Metaphors and descriptive language

Further, we annotate descriptive expressions based on the *patient’s perspective* even if they do not occur in a medical dictionary. We always try to follow the patient’s perspective: If the patient thinks something (e.g., a symptom, an irregularity) is a disorder, then we annotate it as **disorder** .

- (2) (en) (...) I felt like I would imagine someone that had **MS_{disorder}** would feel like, **swaying_{disorder}**,
pulling myself up stairs_{disorder}, (...)

- (fr) (...) J'ai **failli tomber dans les pommes_{disorder}** , (...)
*[I **almost passed out_{disorder}**]*
- (de) Die **Beine_{anatomy}** **fühlen sich nicht stark_{disorder}** man hat **Gefühle des Ungleichgewichts_{disorder}**
*[The **legs_{anatomy}** **do not feel strong_{disorder}** , there are **feelings of imbalance_{disorder}**]*
- (ja) **ずっと お腹_{anatomy}** **がゴロゴロいってる_{disorder}**
*[My **stomach_{anatomy}** **keeps saying grrrr_{disorder}**]*

Oftentimes, patients use metaphors to describe their suffering or, on the other side, a good experience with medication therapy. Since metaphors are descriptive language as well, we annotate them as we would annotate explicit symptom descriptions. Later, we can re-investigate those “special disorders”.

- (3) (en) I felt always like I had a **veil over my head_{disorder}** and **lead in my legs_{disorder}** .
 (fr) (...) à chaque effort, mon **cœur_{anatomy}** **bat la chamade_{disorder}** et j'ai ne n'ai **pas beaucoup de souffle_{disorder}** .
*[With every effort, my **heart_{anatomy}** is **racing_{disorder}** and I am **out of breath_{disorder}**]*
- (de) (...) nur **1 Woche später_{rel. point in time}** war ich **wie im 7. Himmel_{positive opinion}** .
*[Just **one week later_{rel. point in time}** I was **on cloud nine_{positive opinion}** .]*
- (ja) * **マイスリー_{drug}** **を飲むと 脳_{anatomy}** **が強制終了_{disorder}** **する**
*[**Zolpidem_{drug}** makes my **brain_{anatomy}** **shut down_{disorder}**]*

Determiners and Possessives

We do not include determiners or possessive pronouns in an entity.

- (4) (en) *I only really felt the **burning sensation_{disorder}** in the **arms_{anatomy}** and **chest_{anatomy}** when I ...
 (fr) (...) J'ai développé une **très forte sinusite chronique_{disorder}** ,(...)
*[I have developed **severe chronic sinusitis_{disorder}**]*
- (de) Seit zwei Tagen_{duration time} ist meine **Übelkeit_{negated disorder}** wieder weg, doch da ...
*[**Since two days_{duration time}** my **nausea_{negated disorder}** is gone again, but since ...]*
- (ja) **この **薬_{drug}** **は効かなかった_{negative opinion}**
*[**This drug_{drug}** **didn't work_{negative opinion}** .]*

Enumerations

Consecutive entities or enumerations that are, for example, separated by commas or conjunctions are to be split apart and annotated separately.

- (5) (en) I felt **pain_{disorder}** in my **arms_{anatomy}** , **legs_{anatomy}** , **ears_{anatomy}** and **toes_{anatomy}** .
 (fr) **4_{measure}** **opérations_{other}** , **himurel_{drug}** , **pentasa_{drug}** , **methotrexate_{drug}** , (...)
*[**4_{measure}** **surgeries_{other}** , **himurel_{drug}** , **pentasa_{drug}** , **methotrexate_{drug}** , ...]*
- (de) Vor einem Jahr_{rel. point in time} bekam ich **kurz hintereinander_{frequency time}** **wei Herzinfarkte_{disorder}**
 , einen **Schlaganfall_{disorder}** und eine **Embolie_{disorder}** .

[A year ago^{rel. point in time} had two heart attacks_{disorder} , a stroke_{disorder} and an embolism_{disorder} in quick succession^{frequency}]

(ja) まつ毛_{anatomy} や 眉毛_{anatomy} も 抜けてしまった_{disorder} ので
 [Because my eyelashes_{anatomy} and eyebrows_{anatomy} have fallen out_{disorder} too.]

Nested and Overlapping Entities

Nested entities are not permitted; we always annotate the largest phrase. For example, in the case of “headache,” we do not split the word into “head” and “ache”. The general rule is to apply a syntax-based decision, i.e., basic noun phrases (without preposition, particle, etc.) are annotated as one entity.

This is also language-dependant:

- German: do not split compound words, e.g. “Kopfschmerzen_{disorder}” [*headache*] is annotated as one entity.
- Japanese:
 - do not split compound words based on standard tokenization
 - split noun phrases (including compound nouns) at “prepositions” (particles て, に, を, は, の)
- French: basic noun phrase (“douleur thoracique_{disorder}”) [*chest pain*] is annotated as one disorder, otherwise we separate the annotations, e.g. “douleur_{disorder} au thorax_{anatomy}” [*chest pain*].

This approach also automatically excludes overlapping entities. For specific entity types, we also added prioritization rules to help in the decision of which mention to annotate.

Discontinuous Entities

Discontinuous entities are allowed if there is no easier solution, i.e. when annotation as one entity is not possible or does not make sense. Please see the following examples:

1. “it hurts in the left lung_{anatomy} and right lung_{anatomy}” (two entities)
2. “pain on the left lung, but no issues were found on the right” → annotation using two separate, partially overlapping entities, one continuous and one discontinuous as shown below:
 - “pain_{disorder} on the left lung_{anatomy}, but no issues^{negated}_{disorder} were found on the right_{anatomy}” (continuous entity)
 - pain on the left lung_{anatomy}, but no issues^{negated}_{disorder} were found on the right_{anatomy} (discontinuous entity)
3. Similarly as above, the phrase “nerves / muscle cramps” is annotated as two separate, *partially overlapping* entities:

- nerves_{disorder} / muscle cramps_{disorder} (discontinuous entity)

- “nerves / **muscle cramps_{disorder}**” (continuous entity)

In case a discontinuous entity is necessary, we limit the number of entity fragments to two.

Punctuation

Punctuation is not to be included in the annotation (except for, e.g., hyphens or abbreviations etc.).

Spelling Mistakes / Colloquial Language

Since spelling mistakes can occur often particularly when writing medication names, we treat them as if correctly written as long as we can easily understand what the user meant.

Abbreviations

Further, also abbreviated expressions are to be annotated. Abbreviations are often used for drug names, but also for disorders or doctors' profession names.

- (6) (en) (...) I felt like I would imagine someone that had **MS_{disorder}** would feel like (...)
 (fr) Pour l'instant le **gastro_{doctor}** ne me parle pas de **rémission_{other}** !

[so far, my **GI_{doctor}** hasn't said anything about **remission_{other}** !]

- (de) Ich glaube, ich bleibe auch erst einmal bei dem **Gyn_{doctor}** der letzten Jahre, (...).
 [I think I'll stay with my **gyn_{doctor}** of the last years for the time being.]

- (ja) * **ドセ_{drug}** の **浮腫み_{disorder}** も気になる

[I'm concerned about **swelling_{disorder}** by **doce(taxel)_{drug}**]

2.2 Drug

With **drug_{drug}**, we annotate any mention of a medication name, brand, or agent. We also include dietary supplements.

As an exception, we include drug-based treatments too, such as “chemotherapy” and “PUVA therapy” (PUVA = **P**soralen and **U**ltraviolet **A**). However, we label completely non-drug involving therapies **other** instead.

- (7) (en) **Lipidor_{drug}** did the job^{positive} on my **cholesterol_{function}** both LDL and HDL.
 (fr) l' **entyvio_{drug}** c'est pas miracle mais bon ça aide^{positive}. bon courage à tous.

[**entyvio_{drug}** is no miracle, but well, it does help^{positive}. good luck to all.]

- (de) Ich nehme **Betablocker_{drug}**.

[I take **beta blockers_{drug}**.]

- (ja) **夜_{time}** **デパス_{drug}** で **眠れている_{function}** なんですけど、(...)

[I can **sleep_{function}** at night_{time} with **Etizolam_{drug}**]

Prioritization of drug In case the **route** and **drug** are one word (e.g., a compound) or connected by a hyphen, which might be the case for German, we prioritize **drug** over **route** and label the entire spans as **drug**.

- (8) (en)
(fr) “Urogestgel_{drug}” or “Estradiol-Creme_{drug}”
[Urogest_{drug} gel / Estradiol_{drug} cream]
(de)
(ja)

2.2.1 Triggers for Medication Status Changes

Here, we annotate phrases describing or triggering a change in medication intake with the entity tag `change_trigger`_{change_trigger}. Typical words might be, for example, *increase*, *reduce*, *begin*, *one dose of*, etc.

To specify what kind of change occurred, we add the attributes `start` (the trigger specifies that a medication was just started), `stop` (a medication was stopped), `increase` (the dosage was increased), `decrease` (the dosage was decreased), and `unique_dose` (the medication was only given/taken once) to the `drug` they refer to (see below in Section 2.2.2).

- (9) (en) I now have `increased`_{change_trigger} my intake of `Vitamin C`^{`increased`}_{drug} to `16,000 mg / day`_{measure}, and we’ll see how this works out.
(fr) J’ai `oublié`_{change_trigger} de prendre mon `citalopram`^{`decreased`}_{drug} pendant 3 jours_{duration}
[I `forgot`_{change_trigger} to take my `citalopram`^{`decreased`}_{drug} for 3 days_{duration}]
(de) Ich hatte `vor einer Woche`^{`rel. point in time`}_{time} die `Betablocker`^{`decreased`}_{drug} `reduziert`_{change_trigger} aber nur von einer `23mg`_{measure} auf die Hälfte_{measure}.
[I had `reduced`_{change_trigger} `beta blockers`^{`decreased`}_{drug} a week ago^{`rel. point in time`}_{time} but only from `23mg`_{measure} to `half of it`_{measure}]
(ja) 10日後くらいに^{`rel. point in time`}_{time} ドセタキセルが`始まります`_{change_trigger}
[`Docetaxel`^{`started`}_{drug} `starts`_{change_trigger} in about 10 days^{`rel. point in time`}_{time}]

2.2.2 Attribute: Drug Changes

The attributes referring to the entity `drug` provide additional details about the context in which the medication is taken. We consider the attributes `started`, `stopped`, `increased`, `decreased` and `unique_dose`. Some examples are provided below:

- (10) (en) I now have `increased`_{change_trigger} my intake of `Vitamin C`^{`increased`}_{drug} to `16,000 mg / day`_{measure}, and we’ll see how this works out.
(fr) Je suis sous `sertraline`_{drug} (`25`_{measure} puis_{change_trigger} `50`_{measure} en dosage)
[I’ve been taking `sertraline`_{drug} (dosage `25`_{measure} then_{change_trigger} `50`_{measure})]
(de) Ich hatte `vor einer Woche`^{`rel. point in time`}_{time} die `Betablocker`^{`decreased`}_{drug} `reduziert`_{change_trigger} aber nur von einer `23mg`_{measure} auf die Hälfte_{change_trigger}.
(ja) * `副作用`_{disorder} が強くて、`レクサプロ`^{`stopped`}_{drug} `辞めました`_{change_trigger} !
[I `stopped`_{change_trigger} `Lexapro`^{`stopped`}_{drug} because a `side effect`_{disorder} was strong]

If the patient describes having forgotten the medicine, we add the attribute `decrease` except the context suggest a complete stop (then we add `stop`). Conversely, if she describes taking, for example,

a double dose, this is to be marked as an **increase**.

Abbreviations of drug names

We also annotate abbreviations or colloquial names of drugs.

- (11) (en) *In my desperation, I also tried an **AD_{drug}** .
 (fr) (...) je passe une **radio_{test}** des **2 mains_{anatomy}** **mercredi matin_{rel. point in time}** avant ma **perf_{drug}** , (...)
 [I'm having a **CT_{test}** for **both hands_{anatomy}** on **Wednesday morning_{rel. point in time}** before my **IV_{drug}**]
 (de) Nun habe ich also mit **Candesartan_{stopped drug}** und **Opi_{stopped drug}** (...) **aufgehört_{change.trigger}** .
 [So now I have **stopped_{change.trigger}** using **Candesartan_{stopped drug}** and **Opi_{stopped drug}** .]
 (ja) なんか **SSRI_{drug}** 増やしてほしい。
 [I need more **SSRI_{drug}**]

Mentions referring to a drug

Further, mentions referring to a drug but not clearly stating the drug's name are also annotated (see also example 13 (en)).

- (12) (en) The **pill_{drug}** **does its job_{positive opinion}** , (...)
 (fr) (...), j'ai pris **deux_{measure}** **pilules_{drug}** **par jour_{measure}** , (...)
 [I took **two_{measure}** **pills_{drug}** **a day_{measure}**]
 (de) Ich nehme die **Tabletten_{drug}** **seit 2 Tagen_{duration time}**
 [I take those **pill_{drug}** for **two days_{duration time}**]
 (ja) **漢方薬_{drug}** を購入して **飲み始めた_{change.trigger}** 所、 (...)
 [Once I **started_{change.trigger}** taking purchased **Chinese medicine_{drug}** , ...]

2.3 Disorder

A **disorder_{disorder}** annotation denotes any disease, sign or symptom related to the patient's health, including mental issues. Sometimes a **disorder** may be expressed as a parameter in combination with a value: e.g., **high LDL_{disorder}** (parameter=LDL, value=high)². When the value is outside the normal range, this describes a **disorder** . Sometimes, disorders are only referred to very broadly, e.g., it might happen that the patient simply says “I do not feel well”; These expressions are also treated as disorders.

- (13) (en) I **tried_{change.trigger}** the advertised **Arthritis medicines_{stopped drug}** with **severe side-effects_{disorder}** and only tried this one because the **doctor_{doctor}** had samples.

²If the value does not directly modify the target noun, the corresponding appropriate entities should be labeled separately. E.g. “**LDL_{function}** was **high_{measure}**”

- (fr) J'ai une **maladie de crohn_{disorder}** depuis 36 ans^{duration}_{time} (...)
- [I've had **crohn's disease_{disorder}** for 36 years^{duration}_{time} (...)]
- (de) Nach langen, qualvollen 11 Monaten^{duration}_{time} wurde eine **Gürtelrose ohne Ausschlag_{disorder}** diagnostiziert.
- [After a long, agonizing 11 months^{duration}_{time} I was diagnosed with **shingles without a rash_{disorder}** .]
- (ja) 昼間^{rel. point in time}_{time} レクサプロ^{drug} が **副作用_{disorder}** ひどくて^{negative}_{opinion} 未だに **気持ち悪い_{disorder}**
- [Daytime^{rel. point in time}_{time} Lexapro still **makes me sick_{disorder}** because the **side effects_{disorder}** are so **bad^{negative}_{opinion}**]

Disorder vs. Function

We annotate adverse biological processes as **disorder**, and neutral/positive processes as **function**, i.e. in general, a negated function is a disorder (but not vice versa).

To distinguish disorder versus function, we apply the following rules:

1. If the entity in question is a noun phrase and describes a malfunction, we label it **disorder_{disorder}** rather than **negated function^{negated}_{function}**: “I have **no appetite_{disorder}** .”
2. If, however, a malfunction is expressed beyond a continuous noun phrase, we label it **negated function^{negated}_{func}**: “My **appetite^{negated}_{function}** has disappeared.”

2.3.1 Negation of Disorders

Currently, we only apply the negation attribute to the entity annotation **disorder** and **function**. For **disorder**, note that we do not give “negated” value to the disorders that do not completely disappear (e.g. “a **long-running headache_{disorder}** was **almost eased^{positive}_{opinion}**”) because they still exist at least a little. Most such cases would accompany **opinion** entities, which are regarded as richer descriptions of the disorders’ status.

- (14) (en) There is no **abnormality^{negated}_{disorder}** .
- (fr) Par contre j'étais pas plus **fatigué^{negated}_{disorder}** que la normale.
[however, I wasn't more **tired^{negated}_{disorder}** than usual.]
- (de) Folgende Beschwerden sind schon weg: **Nackenschmerzen^{negated}_{disorder}** , ...
[The following ailments are already gone: **neck pain^{negated}_{disorder}** ,]
- (ja) * **イライラ^{negated}_{disorder}** などはしなかった
[I didn't **feel irritated^{negated}_{disorder}** or something]

2.3.2 Partial Negation (of Disorders)

We do not annotate partial negations since these require a more detailed annotation which is, for now, out of scope.

- (15) (en) My **hair_{anatomy}** was not lost entirely.

- (fr)
 (de) Die **Brust_{anatomy}** tut schon viel weniger weh.
 [The **chest_{anatomy}** hurts much less already.]
 (ja)

2.4 Function

With **function**, we mark all body functions and processes. Body functions are often represented in biomarkers (e.g., “HDL” and “white blood cells (WBC)”). This includes mental functions, too.

- (16) (en) **Lipidor_{drug}** did the job^{positive}_{opinion} on my **cholesterol_{function}** both LDL and HDL.
 (fr) La seule chose qu'on m'a donné pour essayer de **dormir_{function}** c'est du **Xanax_{drug}**
 [*Xanax_{drug} is the only thing I was given to help me **sleep_{function}** .]*
- (de) **Opripramol_{stopped_{drug}}** hatte_{change_trigger} ich ja nur **zwei Abende lang_{duration}** zum **Schlafen_{function}**
 je **eine halbe_{measure}** genommen, also nur eine **winzige Dosis_{measure}** .
 [I had_{change_trigger} only taken **half a dose_{measure}** of **Opripramol_{stopped_{drug}}** for two evenings_{duration} or **sleeping_{function}** , so only a **tiny dose_{measure}** .]
- (ja) ** **白血球_{function}** は問題なかった。
 [no problem with **leukocyte_{function}**]

2.4.1 Negation of Functions

For **function**, we add the negation attribute when the function goes wrong. It is not limited to absence or stopping (e.g. “**appetite_{negated_{function}}** disappears”), but also includes abnormality, i.e. when the original body processes changes in any way (e.g. “**WBC_{negated_{function}}** is decreasing”). Note that continuous (noun/verbal) phrases of malfunctions should be annotated not as negated function, but as disorder : e.g. “I have **no appetite_{disorder}** ” and “**decreased WBC_{disorder}** was observed” because malfunctions can be regarded as **disorder** . See also Section 2.3.

2.5 Anatomy

With this, we annotate all organs or anatomical parts. We usually do not annotate smaller parts such as partial tissues and blood cells as **anatomy**, but as **function**. However, if a sentence describes a disorder found in a cell, the cell could be an **anatomy** entity.

- (17) (en) Had numerous odd **aches_{disorder}** , especially in the **leg area_{anatomy}** .
 (fr) (...) mais elle a fait une **réaction_{disorder}** au **pancréas_{anatomy}** , (...).
 [but her **pancreas_{anatomy}** was **affected_{disorder}** ,]
 (de) Ich besitze nur noch eine **Niere_{anatomy}** .
 [I only have one **kidney_{anatomy}** left.]
 (ja) ** **お腹_{anatomy}** が **刺すように痛い_{disorder}**
 [I feel a **stabbing pain_{disorder}** in my **stomach_{anatomy}**]

Anatomy entities are *not annotated* when within a larger entity such as within a **disorder** or **test**. Therefore, we prioritize the annotation of **disorder** and **test**.

- (18) (en) Pain_{disorder} under ribs_{anatomy} , restless legs_{disorder} .
(fr) J'ai beaucoup de douleurs_{disorder} au quotidien_{frequency} maux de tête_{disorder} ,
douleurs musculaires_{disorder}
[I am in pain_{disorder} everyday_{frequency} headaches_{disorder} , sore muscles_{disorder}]
(de) Magen/Darmspiegelung_{test} , weil ich immer Magenschmerzen_{disorder} hatte.
[Gastrointestinal endoscopy_{test} because I always had stomach pain_{disorder}]
(ja) ** 肺がん_{disorder} と宣告されてしまった
[I was diagnosed with lung cancer_{disorder} .]

2.6 Test

With **test**, we mark all medical tests, interviews, examinations or any other procedure that produces a result to be used in medical diagnoses.

- (19) (en) Blood test_{test} was normal_{measure} .
(fr) je passe une radio_{test} des 2 mains_{anatomy} mercredi matin_{rel. point in time} avant ma perf_{drug} ,
(...)
[I'm having a CT_{test} for both hands_{anatomy} on Wednesday morning_{rel. point in time} before my IV_{drug}]
(de) Ich habe ganz zu Beginn_{rel. point in time} der WJ_{function} auch mal Speicheltests_{test} machen lassen, mit zum Teil abstrusen Werten.
[At the very beginning_{rel. point in time} of the MP_{function} , I also had saliva tests_{test} done, some of which showed abstruse values.]
(ja) ** 血液検査_{test} の結果が怖いです
[I'm afraid of the blood test_{test} results.]

2.7 Opinion

This denotes the **writer's personal** evaluation or opinion of a medication (**drug**), health state (**disorder**) or biological process (**function**). This entity could be a detailed description of a mental function or disorder (e.g. “My feeling_{function} is stable_{positive opinion} ”). Usually, these assessments are rather colloquial and it is difficult to find an appropriate span. Therefore, we follow again the principle of taking the shortest span possible.

The opinion always comes with a sentiment attribute: either **positive**, **negative**, or **neutral**. A **positive** assessment is often associated with an improvement of a disease or with a good experience of the patient with medication. We do not give *negated* (the *negation* attribute) to the corresponding **disorder**. **We annotate all opinions to make it easier for the annotators and keep annotation consistent with the other entities.** Patient-related opinions are then explicitly expressed by relations.

- (20) (en) *This drug_{drug} is a nightmare_{negative opinion} and should be discontinued_{negative opinion} .
(fr) l'entyvio_{drug} c'est pas miracle mais bon ça aide_{positive opinion} .
[entyvio_{drug} is no miracle, but well, it does help_{positive opinion} .]
(de) Ich nehme doch jetzt 12 Wochen_{duration} kein_{change_trigger} Lyrica_{stopped drug} mehr_{change_trigger}

und dafür_{change_trigger} 50mg_{measure} Opi_{drug}^{started} und das lief auch richtig gut_{opinion}^{positive} .
 [I did not take_{change_trigger} Lyrica_{drug} for 12 weeks_{time}^{duration} and instead_{change_trigger} took 50mg_{measure}
 of Opi_{drug} and that went really well_{opinion}^{positive} , too.]
 (ja) * アモキシサン_{drug} 効いてる_{opinion}^{positive} おかげか 気持ち_{function} は 少し楽になった_{opinion}^{positive}
 [My feeling_{function} becomes a little better_{opinion}^{positive} now that the amoxan_{drug} is working_{opinion}^{positive} .]

Emojis / Emoticons We include emojis or emoticons if they explicitly encode an opinion.

(21) (en) **This drug was
 (fr)
 (de)
 (ja)

2.7.1 Attribute: Sentiment

When patients describe their current state of health or when they assess the consequences of a medication they took, they often use emotional words. Therefore, we add, if applicable, the sentiment markers **positive**, **negative**, or **neutral** to the phrases annotated with **opinion**.

(22) (en) I really made a difference, improvement of quality of life_{opinion}^{positive} .
 (fr) C'est nul_{opinion}^{negative} le Xanax_{drug} ça marche même pas_{opinion}^{negative}
 [Xanax_{drug} sucks_{opinion}^{negative} , it doesn't even work_{opinion}^{negative}]]
 (de) Dann, nachdem ich mit Triseqenz Hormontabl._{drug}^{started} angefangen_{change_trigger} habe, nur
 1 Woche später_{time}^{duration} war ich wie im 7. Himmel_{opinion}^{positive} .
 [Then, after I started_{change_trigger} Triseqent hormon pills_{drug}^{started} , just one week later_{time}^{rel. point in time}
 I was on cloud nine_{opinion}^{positive} .]
 (ja) レクサプロ_{drug} は 強迫_{disorder} には 効かなかったです_{opinion}^{negative}
 [Lexapro_{drug} didn't help_{opinion}^{negative} with obsessive thoughts_{disorder} .]

2.8 Measure

With **measure**, we mark clinically relevant measurements, such as drug dosages and test results. The expression is typically a numerical value that accompanies a measurement unit.

(23) (en) Started 2 years ago_{time}^{rel. point in time} with 10 mg_{measure} then 6 mos later_{time}^{duration} doc_{doctor}
 upped to 20_{measure} .
 (fr) pentasa_{drug} , cortancyl_{drug} (10mg_{measure}) , ...
 [pentasa_{drug} , cortancyl_{drug} (10mg_{measure}) , ...]
 (de) Das Utrogest_{drug} sind Weichkapseln_{route} mit 100 mg_{measure} naturid. Progesteron_{drug} und
 sie sind verschreibungspflichtig.
 [Utrogest_{drug} are soft capsules_{route} with 100 mg_{measure} of nature-id. progesterone_{drug} and they are
 prescription-only.]

- (ja) 生検_{test} の結果 Ki67_{function} が 46%_{measure} だったため、通院にて治療中です
 [The biopsy_{test} results showed a Ki67_{function} of 46%_{measure}, and I am in the hospital for treatment.]

In some cases it might happen that it is difficult to distinguish between a phrase being a **opinion** or a **measure** when they occur together with a **test** (see for example 4.3, Ambiguity). In these cases, we prioritize **measure**.

Temporal Measurements

Note that temporal measurements (e.g. “5 times per month”) should be annotated as **time** entities (see Section 2.9) **unless** they indicate the amount/dosage of a drug: If we can relate the expression with the **dosage** relation to a **drug**, then it is probably a **measure**.

- **I took three days' worth_{measure} of medicines_{drug} at once today_{date} time .
- **Mom should take this pill_{drug} three times a day_{measure} .

2.9 Time

As temporal markers we define all mentions of *frequency*, *duration*, *date*, or *relative points in time*. For a more narrow description, we use those characteristics (frequency, duration, ...) as attributes. Also, we include prepositions (e.g. “in”, “from”, “before”, and “since”) in the entity since these carry relevant information specifying the semantics of the expression. If there is no suitable attribute, we leave it blank (i.e. we do not add an attribute).

Time expressions include e.g. “night”, “afternoon”, “for one week” (mostly **duration**), but also expressions like “last Monday”, “in two weeks” (**relative points in time**), “every morning”, “after lunch” (**frequency**) or “11.07.2022“ (**date**).

- (24) (en) Instead of taking the pill_{drug} decreased 2X daily_{measure}, as prescribed I take it (...) usually about 3-4 times per week_{measure}, but often skipping a week or two at a time_{frequency} time .
- (fr) Bonjour, Je suis sous entyvio_{drug} depuis juillet 2019_{duration} et ce traitement fonctionne fort bien_{positive} opinion au niveau de la colite_{disorder} .
 [Hi, I've been taking entyvio_{drug} since july 2019_{duration} and the drug has been working very well_{positive} opinion for my colitis_{disorder} .]
- (de) Hallo liebe <user>, vor 2 Monaten_{rel. point in time} time habe ich meine Frauenärztin_{doctor} gefragt, da ich zwischendurch einen Hormontest_{test} wollte.
 [Hello dear <user>, 2 months ago_{rel. point in time} time asked my gynecologist_{doctor} because I wanted a hormone test_{test} in the meantime.]
- (ja) 3年前の2月ごろに_{date} time 乳がんが発覚
 [Breast cancer_{disorder} was discovered around February 3 years ago_{date} time]

2.9.1 Attribute: Temporality

The following attributes of timex expressions are considered in our annotations: **frequency**, **duration**, **date** and **relative point in time**. The attributes should help to specify the annotated timex ex-

pressions in more detail. See examples in Section 2.9. If none of the attributes fits, we do not add any.

2.10 Route

Route annotates the means of medication intake, e.g. via pills or via injection. We, thus, annotate verbs indicating medication intake such as “drink” or “inject”, but exclude too general verbs (e.g. “have” and “take”). If a mention like “pill” refers to a drug (and not to the means of intake), it should be annotated as drug .

- (25) (en) It has not eliminated the need for **oral_{route}** **pain med_{sdrug}** in all situations but **has helped_{positive opinion}** .
- (fr) ... , depuis 1 an et demi^{duration_{time}} **perfusion_{route}** d **entyvio_{drug}** tous les mois^{frequency_{time}} ...
 [for the past 18 months^{duration_{time}} I get **entyvio_{drug}** **IV_{route}** every month^{frequency_{time}}]
- (de) Ich habe das leider nur mit **Tabletten_{route}** gemacht (mir wollte keiner meiner **Ärzte_{doctor}** eine **Infusion_{route}** verschreiben).
 [Unfortunately, I only did this with **pills_{route}** (none of my **doctors_{doctor}** would prescribe me an **infusion_{route}**).]
- (ja) *現在 **内服_{route}** しているのは **レトロゾール_{drug}** です
 [I am currently taking **letrozole_{drug}** **orally_{route}** .]

2.11 Doctor

We moreover annotate all medical job descriptions (e.g. physician, dentist, nurse, (psycho) therapist ...). This entity tag is for job descriptions *not* for the names of the doctors.

- (26) (en) I took **lipitor^{increased_{drug}}** **10mg_{measure}** for only about two months^{duration_{time}} then **cardiologist_{doctor}** **increased_{change_trigger}** it to **20mg_{measure}** .
- (fr) (peut etre de **l'arthrose_{disorder}** dixit mon **docteur traitant_{doctor}**) ...
 [(could be **arthritis_{disorder}** according to my **GP_{doctor}**)]
- (de) (...), hatte ich **gestern^{rel. point in time_{time}}** einen Termin bei meinem **Internisten_{doctor}** .
 [..., I had an appointment with my **internist_{doctor}** **yesterday^{rel. point in time_{time}}** .
- (ja) **病院の **先生_{doctor}** がこの薬を **飲み_{route}** って言うんです。でも信用できません
 [The **doctor_{doctor}** at the hospital says I should **drink_{route}** this medicine. But I don't trust him.]

2.12 Entities for De-Identification

To make sure personal information like user names, URLs, e-mail addresses, etc. do not end up in the final corpus, even if we pre-processed the data, we also mark these information with the respective labels to later apply a final post-processing. Replacing those entities with their corresponding marker, e.g. <user>, should not change the content of the document.

User

Since social media users use creative names that are not necessarily easy to find using pre-processing tools, we mark “left-over” user names as well, to de-identify them afterwards if necessary. The

examples below were randomly generated from scratch and not taken from real existing data.

- (27) (en) *Dear **Leopard Footballer_{user}** , thank you for your message.
 (fr) Bonjour **Mûre Vive_{user}** pour ma part ils n'ont pas été efficace^{negative}_{opinion} (...)
*[Hi **Mûre Vive_{user}** , for me they were **not effective^{negative}_{opinion}**]*
 (de) Liebe **Broccoli Klarinette_{user}** danke für deinen Bericht.
*[Dear **Broccoli Klarinette_{user}** , thanks for your report.]*
 (ja) **ゆーりん_{user}** さん、ありがとうございます！
*[Thank you, **Yurin_{user}** !]*

URL

In case there are any URLs or e-mail addresses missed when de-identifying the data, we mark them to be removed later.

- (28) (en) Go to **www.xxxxx.xx.xx_{url}** for more info.
 (fr) Si vous souhaitez discuter plus avant: **www.xxx xxxx xxx xxx_{url}** .
*[If you wish to discuss further: **www.xxx xxxx xxx xxx_{url}** .]*
 (de) Wenn du möchtest, geh doch mal auf die Seite **www.xxx xxxx xxx xxx_{url}** .
*[If you like, take a look at this website: **www.xxx xxxx xxx xxx_{url}** .]*
 (ja) ここに詳しく載ってます **www. x x x. x x_{url}**

Personal information

With this marker, we annotate all other personal information that needs to be removed before data publication (jobs, city, doctor/hospital' names ..). This kind of annotation is only necessary if the de-identification failed. The examples below were randomly generated.

- (29) (en) **My name is **Emanuel Streich_{perso_info}** and I am **16 years old_{perso_info}** .
 (fr) J'ai appris que j'avais **crohn_{disorder}** il y a cinq ans^{rel. point in time}_{time} J' avais **20 ans_{perso_info}** .
*[I was diagnosed with **crohn_{disorder}** **five years ago^{rel. point in time}_{time}** I was **20 years old_{perso_info}** .]*
 (de) *Ich wohne in **Musterhausen_{perso_info}** , das kennst du sicher.
*[I live in **Musterhausen_{perso_info}** , you probably know it.]*
 (ja) ** **伊藤晴美_{perso_info}** 、 **大学2年生_{perso_info}** です。
*[I am **Harumi Ito_{perso_info}** , a **second-year college student_{perso_info}** .]*

2.13 Other

With **other_{other}** , we annotate all remaining entities that refer to a kind of treatment or medical event (pregnancy, wound etc.), but for which we do not have a category. For example, since we do not have an entity for treatments that are not drugs (e.g., *cognitive behavioral therapy*), we would annotate this term as **cognitive behavioral therapy_{other}** . Possible examples in addition are clinical tools (e.g. “syringe”) and medical devices (e.g. “wig”, “dental implant”, and “pacemaker”)

- (30) (en) Just **physical therapy_{other}** and **pain medication_{drug}** .
 (fr)

(de) Ohne BH fallen die **Implantate_{other}** runter.

[Without bra the **implants_{other}** fall off].

(ja) * **抗がん剤_{drug}** の **副作用_{disorder}** で **髪_{anatomy}** が **抜け_{disorder}** て、 **ウィッグ_{other}** を着用して
いました。

[Wore a **wig_{other}** because of **hair loss_{disorder}** due to **side effects_{disorder}** of **anti-cancer drugs_{drug}**]

what about OPs? e.g. aesthetic surgery?

partial negation & entailment are future work; see difficult cases section

3 Relations

In the following, we will give details on how we annotate the relations between the entities. For a better visualizations, we highlight only the relations and entities of the current section. Also, we cut off parts of the original documents to keep every example on one line. In Table 3 we provide an overview of all relations and their arguments. Exceptionally, **other_{other}** can take and accept all relations, for a practical reason.

We do not annotate relations if one of the following points apply:

- The above-mentioned entities are not concerned.
- The document at hand is hypothetical or speculative (from the patient’s perspective).
- The document is formulated as a question.

section	relation	argument 1	argument 2
3.1	caused	{drug , disorder }	{disorder , function}
3.2	treatment_for	{drug }	{disorder , function}
3.3	has_dosage	{drug }	{measure}
3.4	experienced_in	{disorder }	{anatomy}
3.5	examined_with	{disorder , anatomy, function}	{test}
3.6	has_result	{test}	{measure, disorder, function}
3.7	refers_to	{disorder }	{disorder , function ^{negated} }
3.7	refers_to	{drug }	{drug }
3.7	refers_to	{anatomy}	{anatomy}
3.7	refers_to	{function}	{function}
3.8	interacted_with	{drug }	{drug }
3.9	signals_change_of	{drug_status_change_trigger}	{drug }
3.10	has_time	{drug , disorder }	{time}
3.11	has_route	{drug }	{route}
3.12	is_opinion_about	{opinion}	{drug , disorder , function}
3.13	misc	{ANY}	{ANY}
	<i>not tracked</i>	URL, personal info, doctor	

Table 3: Overview of available relations and the entities they associate.

3.1 caused

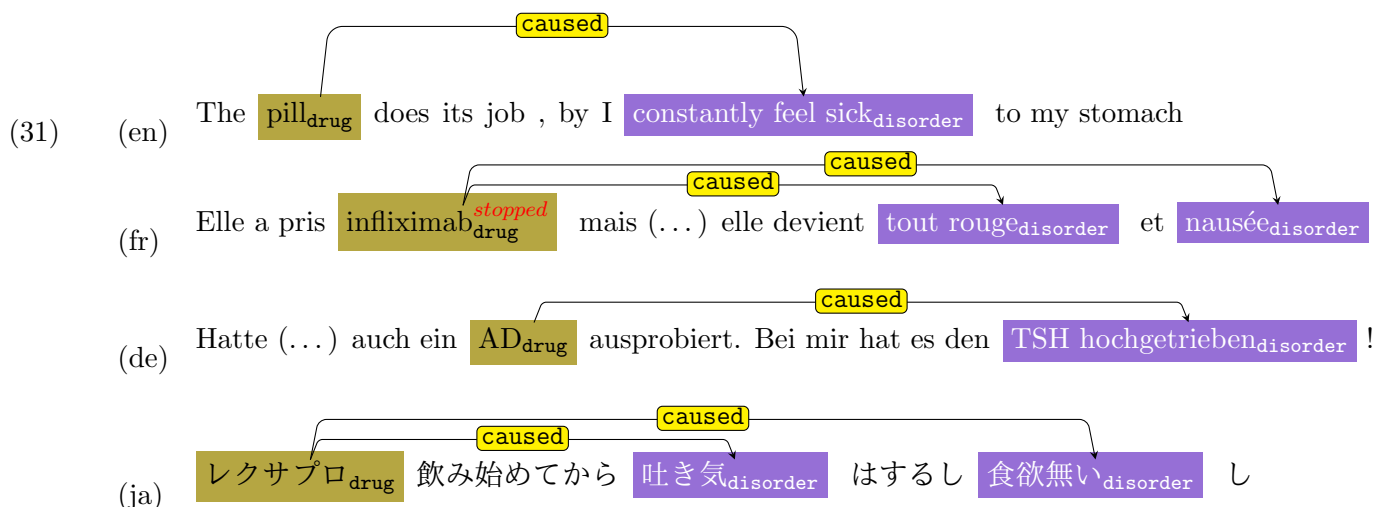
The **caused** relation was defined to be language independent and to be used also with little linguistic knowledge. We only annotate a **caused** relation, when the entities **drug** , **disorder** , or **function** are concerned. For this, we take into account the following:

- The interpreted intention of the author if the annotator(s) judges it to be clearly identifiable.
- Common world knowledge (e.g., the action – reaction principle) and common sense (e.g., a broken leg can not be caused by brushing one’s teeth even if the text author insisted that it was).
- A possible contextual cue from metadata (e.g., the metadata might contain the drug name, which is not necessarily mentioned in the text itself).
- Explicit formulation of a **<cause>** – **<consequence>** relation, i.e., supported by linguistic markers like:
 - explicit discourse inter-clause/sentence articulators: *because, so, then, ...* (including conjunction coordination hinting at causal entailment like “and”, “then”)
 - conditional constructions: “when **<cause>** , **<consequence>** ”, “**<cause>** and **<consequence>** ”, ...
 - restrictive formulations, e.g., “only when **<cause>** , **<consequence>** ”
- Lexical semantics of nouns or verbs, e.g.,:
 - **<cause>** provokes **<consequence>**
 - **<consequence>** is the consequence of **<cause>**
 - **<cause>** was followed by **<consequence>**
 - **<cause>** entailed **<consequence>**
 - **<consequence>** is correlated with **<cause>**
 - **<cause>** is correlated with **<consequence>** and **<cause>** is preceding **<consequence>**
 - **<cause>** is probably linked with **<consequence>** and **<cause>** is preceding **<consequence>**
- (R_0 is a **refers_to** relation) and (**<consequence>** is the target of a **caused** relation) and (**<cause>** is the source of a **caused** relation pointing to the source of R_0)
- **<cause>** **<consequence>** relations are reported by the author of the text (first person) or attributed to another person by the author of the text (second/third person, like parents or siblings)
- Being part of a juxtaposition of linguistic element/clauses/sentences (but only if supported by other context, either cotext and/or metadata elements):
 - **<cause>** **<consequence>**
 - **<cause>** , **<consequence>**
 - **<cause>** . **<consequence>** .
- Being part of a successive temporal relation

- <consequence> after <cause>
- before <consequence> <cause>
- every time <cause> <consequence>

- Juxtaposition of <cause> -<consequence> clause and change of factuality / belief / veracity / opinion:

- <cause> -<consequence> belief clause <veracity expression about previous clause>
- “I though I would not have <consequence> because of <cause> . I was wrong!”
- “I had never never thought that <cause> would yield <consequence>
- “I would not have expected that <cause> would yield <consequence>



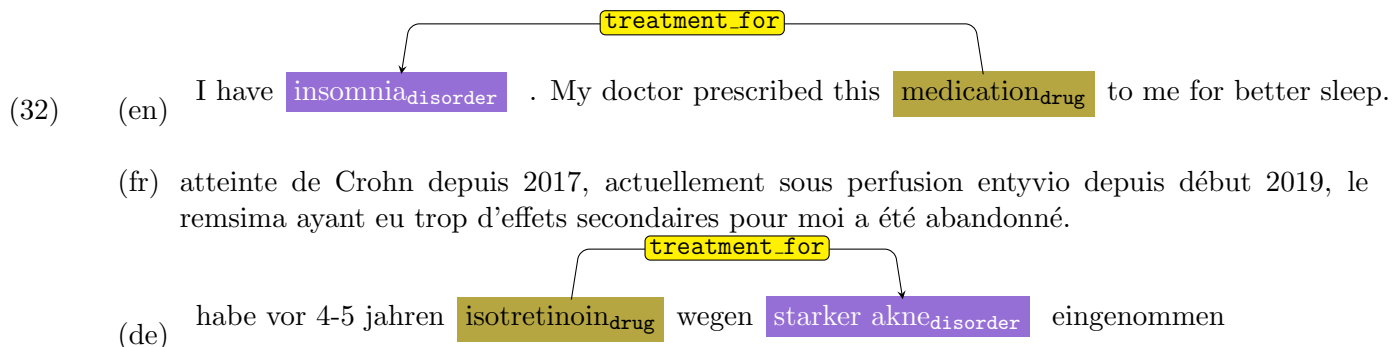
3.1.1 Special Case: Effects of Stopping Medication Intake

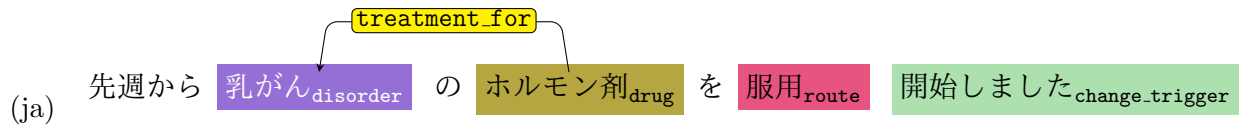
Officially, drug withdrawal is an adverse drug reaction. Therefore, we include it in the annotations and draw a **caused** relation between the **drug** and the withdrawal symptoms (**disorder**).

Stopping a medication might, however, also bring back the original symptoms or disorder. To ease the annotation burden and make the annotation consistent, we always draw a **caused** relation between a *stopped* drug and the resulting disorder . Note that for the latter, there is most probably also a **treatment_for** relation.

3.2 treatment_for

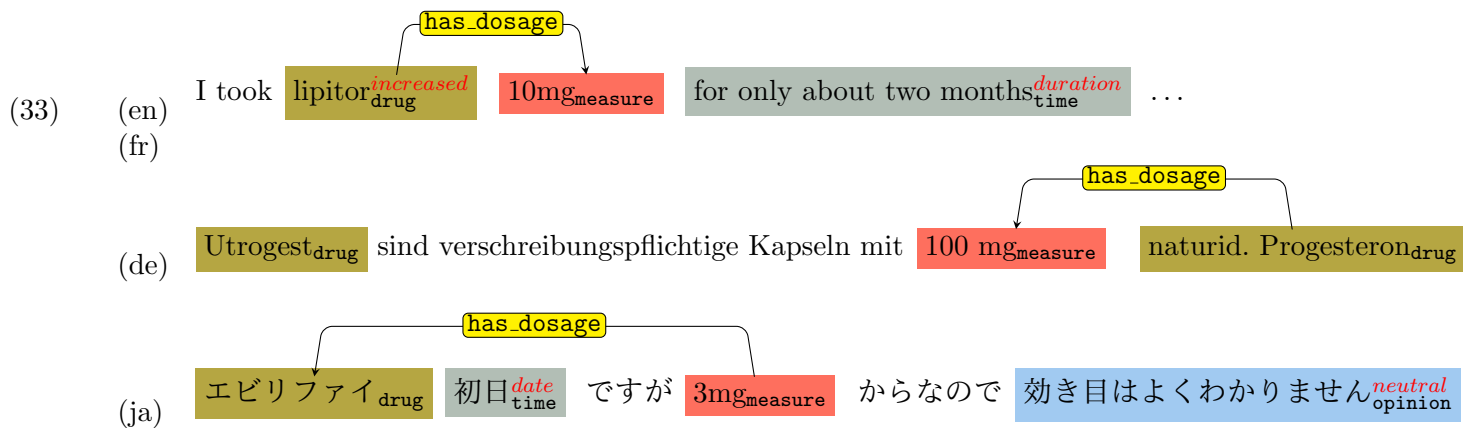
This relation connects a **drug** and the targeted **disorder** , describing the medication that was used to treat the patient’s symptoms.





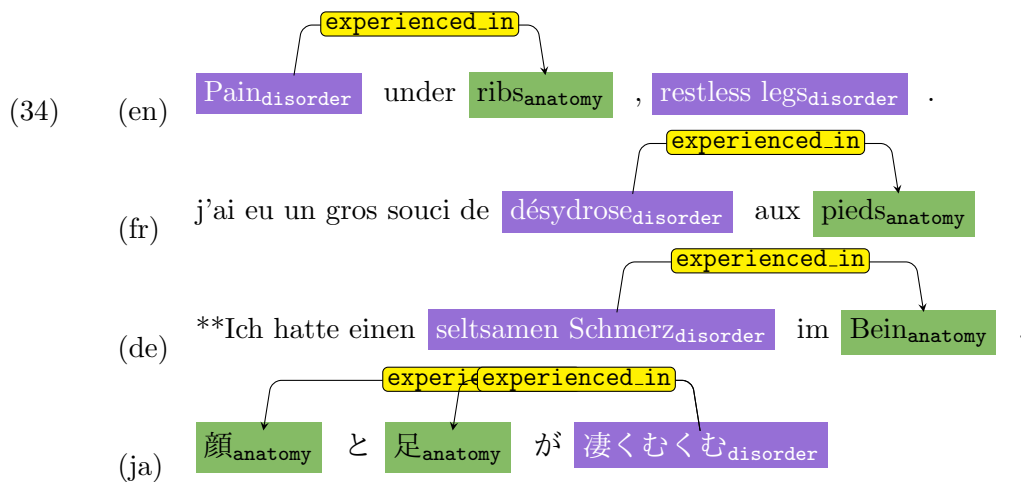
3.3 has_dosage

has_dosage relates a measurement, e.g. the number of pills (measure), with a medication name (drug).



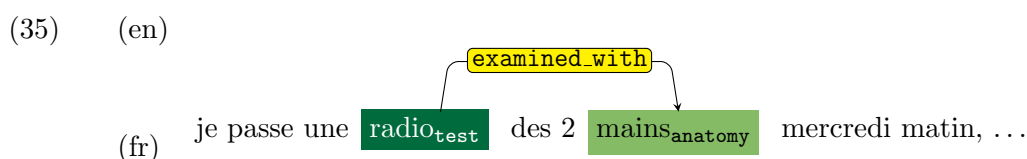
3.4 experienced_in

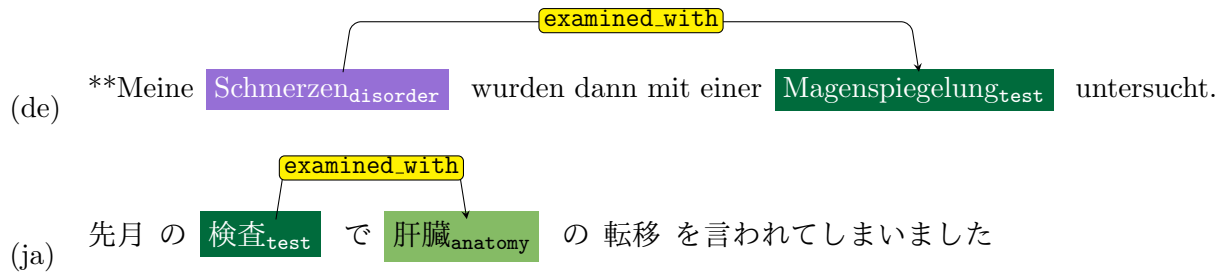
This relation associates a disorder with the location it is felt / experienced in, i.e. a part of the body (anatomy).



3.5 examined_with

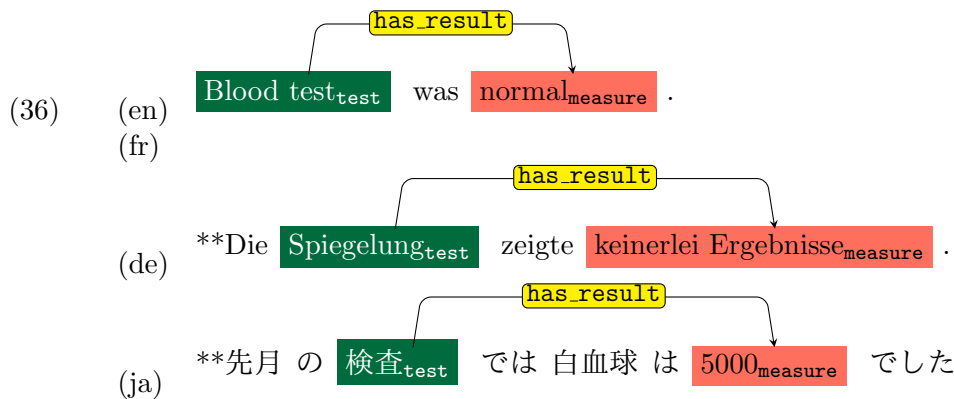
This relation associates a disorder or a function with a test: the test is used to examine the disorder. anatomy entities can be examined with a test, too.





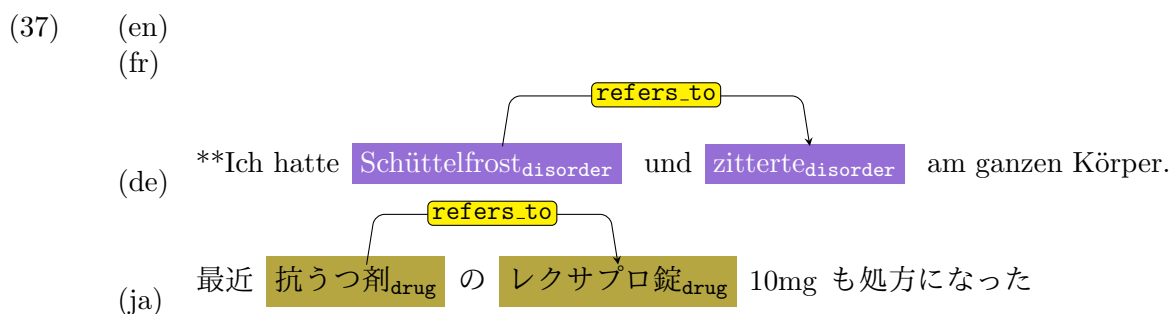
3.6 has_result

Following the line of thought from above, the `has_result` relation then relates the `test` with its result, usually a `measure`. This relation should not be used for `caused` scenarios.



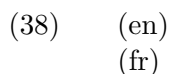
3.7 refers_to

The `refers_to` relation represents a unidirectional link for the entities `drug`, `disorder`, `anatomy`, and `function`, and also for the link between `disorder` and `functionnegated`. It is used to associate similar concepts, but not necessarily to connect the same surface forms (e.g. “Lipitor” and “Lipitor”). Via the `refers_to` relation, we can automatically propagate the relation to all connected targets. The relation allows to chain corresponding entities.



3.8 interacted_with

In some cases, a `drug` – `drug` interactions result in a `disorder`. The relation `interacted_with` is defined for exactly this purpose.



(de) **Die Kombination aus Grapefruitsaft_{drug} und Aspirin_{drug} hat meine Schmerzen nur verschlimme

(ja) * レクサプロ_{drug} と ビール_{drug} 飲んだら_{route} 嘔吐_{disorder} した

3.9 signals_change_of

For connecting the change triggers with the drug that is affected, we use the `signals_change_of` relation.

(39) (en) depuis que j'ai arrêté_{trigger} deroxat_{drug}^{stopped} pour_{trigger} effexor_{drug}^{started} j'ai perdu 3 kilos (...)

(de) **Ich habe mit Triseqenz Hormontabl._{drug}^{started} angefangen_{change.trigger} und fühle mich super.

(ja) リフレックス_{drug} から レクサプロ_{drug} に 変えて_{change.trigger} ふらつき_{disorder}^{negated} が 治まった

3.10 has_time

The relation `time` connects a time expression with either a drug or a disorder.

(40) (en) Bonjour, Je suis sous entyvio_{drug}^{started} depuis juillet 2019_{date}^{time} et ce traitement (...)

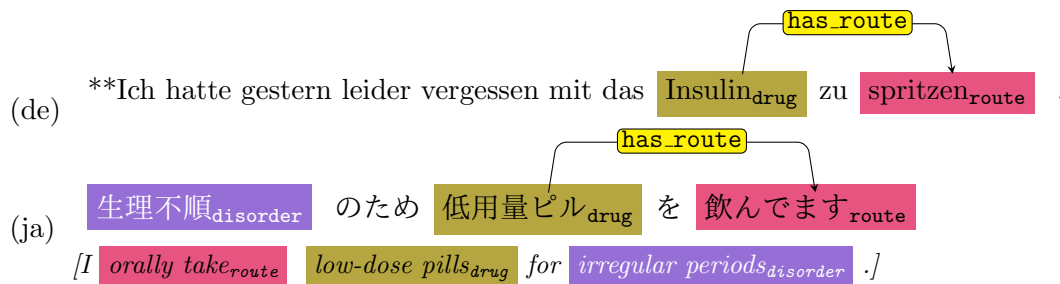
(de) **Seit einer Woche_{duration}^{time} nehme ich Triseqenz Hormontabl._{drug}^{started} und fühle mich super.

(ja) レクサプロ_{drug} 飲み始めて 2週間_{duration}^{time} たちました

3.11 has_route

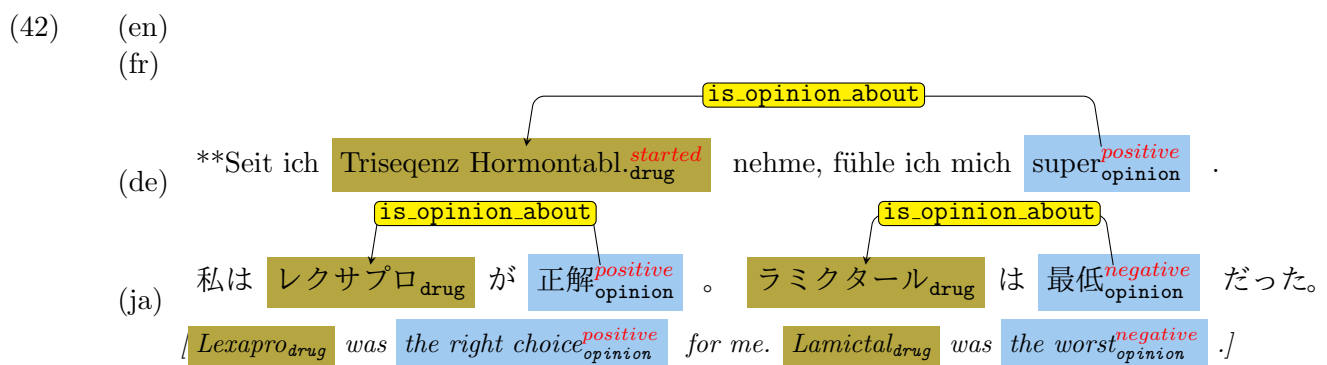
The `has_route` relation associates a drug with the way it is consumed, i.e. the means of intake.

(41) (en)
(fr)



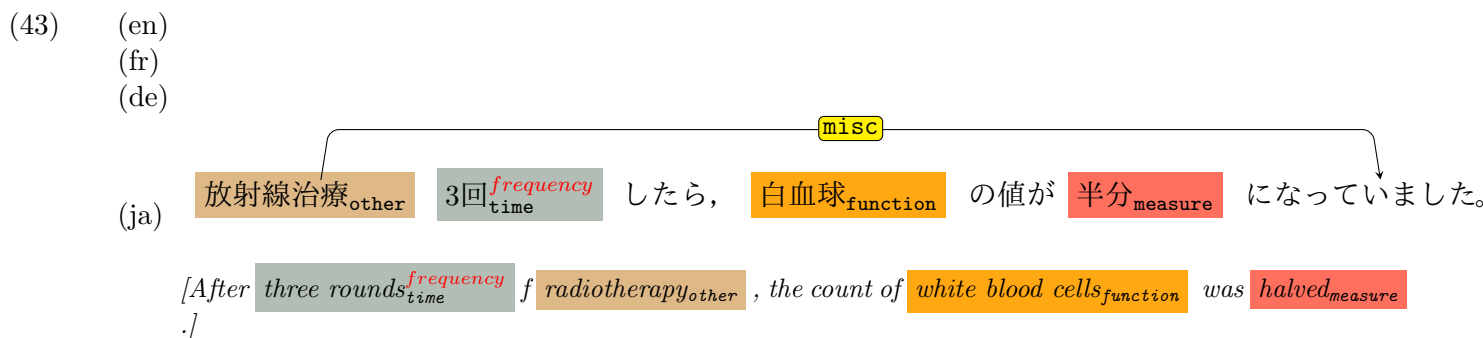
3.12 is_opinion_about

The `is_opinion_about` relation connects any entity with an opinion entity. Mostly, these will be drug or function entities. Note that sometimes it is not possible to find two explicit entities to be connected.



3.13 misc

This relation is a joker similar to the `other` entity label. If we clearly see a worthwhile relation between two entities in terms of adverse drug events, but there is no relation defined (yet), we can use the `misc` link.



4 Difficult Cases

In the following sections, we show examples that we found difficult to annotate. They are either ambiguous or it is in general not clear what is meant by the patient.

4.1 Entailment

Implicit statements entailing or implying disorders or functions are ignored for now and are a subject of future work.

- (44) (en) My eyebrows remain halfway. (*meaning the other half is gone*)
(fr)
(de)
(ja)
- (45) (en) I only eat bread. (*meaning the person cannot eat anything else*)
(fr)
(de)
(ja)

4.2 Advice from other Users

In some cases, one user is repeating the symptoms of another user in their own text and gives some advice. Since we are annotating the data document-wise, we do not take the original patient's view into account in this case. Therefore, we only annotate the entities, but not the relations.

- (46) (en) ****Your** **fatigue_{disorder}** is certainly due to the **heavy bleeding_{disorder}** .
(fr)
(de)
(ja)

4.3 English

Semantics **pain_{disorder}** on the **left lung_{anatomy}** , but **no issues_{negated disorder}** were found on the **right_{anatomy}**

Discontinuity *I took **three days' worth_{measure}** of **medicines_{increased drug}** **at once_{measure}** **today_{date time}**

Ambiguity **EKG_{test}** **perfect_{measure}** , **tri_{test}** were **perfect_{measure}** , **blood sugar_{function}** **perfect_{measure}** , etc

Is *blood sugar* a function or a test? Following up on this, if *perfect* an opinion or a measure?

... **Lipidor_{drug}** **did the job_{positive opinion}** on my **cholesterol_{function}** both LDL and HDL.

Should *LDL* and *HDL* be annotated as function?

4.4 French

... ..., des **boutons_{disorder}** **de la tête au pied_{anatomy}** , ...

Function or not? Suite à ma deuxième **grossesse_{other}** j'ai souhaité passé sur un traitement à faire à domicile, (...)

[After my second **pregnancy_{other}** I wanted to go ahead with home care, (...)]

Depending on the context, *grossesse* (pregnancy) might be a function. UMLS is not clear about that.

4.5 German

4.6 Japanese

Some may be regarded as language-agnostic difficulty.

4.6.1 Distinction of Disorder, Function, and Opinion for sentiment expressions

Sentiment words such as “afraid” and “scare” may represent signs of mental disorders in some cases (disorder), whereas they may exhibit just functional psychological reactions in yet other cases (function). Also, they form opinions towards drugs (opinion). We need to distinguish them according to the local context.

- レキサプロ_{drug}。副作用_{disorder}が怖い_{function}。
[Lexapro_{drug} . Afraid_{function} of side effects_{disorder} .]
- 今日から_{duration}漢方_{time}のみ_{time}にされるらしい、こわ_{function}。
[They are going to make me take only Chinese medicine_{drug} from today_{duration} scary_{function} !]
- 不眠_{disorder}の症状_{disorder}も酷い_{negative}。辛い_{disorder}。
[I also have terrible_{negative} symptoms_{disorder} of insomnia_{disorder} . Painful_{disorder} .]
- 髪の毛_{anatomy}がなくなる_{disorder}ということは女性にとって、最も辛い_{negative}ことです。
[The loss_{disorder} of hair_{anatomy} is the most painful_{negative} thing for a woman.]

4.6.2 Disorder expressions using general words

- 体力_{disorder}がガクンと落ちてしまった
[My physical strength has gone through the roof_{disorder} .]
“体力 (my physical strength)” itself does not fall into an entity, but the whole phrase means a disorder.
- 何を_{disorder}するにも体_{anatomy}が重い_{disorder}、だるい_{disorder}、きつい_{disorder}
[My body_{anatomy} feels heavy_{disorder} , sluggish_{disorder} , and tired_{disorder} in any way]
“重い (heavy)” itself does not fall into an entity, but it represents a disorder in combination with “体 (body)”.
- 地獄_{negative}のように体調が悪い_{disorder}
[My body condition goes bad_{disorder} as hell_{negative}]

The phrase “体調が悪い (body condition goes bad)” forms a disorder only when it appears as a whole. Although it looks like a clause, we did not annotate it with Function (“体調_{negated}が悪い (body condition_{negated} goes bad)”). This is because this particular phrase “体調が悪い (body condition goes bad)” is often used like an adjective “体調悪い (bad-feeling)”, which should be labeled “体調悪い_{disorder} (bad-feeling)”.

4.6.3 Body weight changes with weight values

- 突然の嘔吐_{disorder} と下痢_{disorder} で、1日で_{duration}_{time} 体重2キロ 減った_{disorder}
[Due to sudden vomiting_{disorder} and diarrhea_{disorder}, my weight_{disorder} dropped_{disorder} 2 kilograms in one day_{duration}_{time}]

Here, “2キロ (two kilograms)” is inserted between “体重 (my weight)” and “減った (dropped)” in the original Japanese sentence, which forced the annotation to be *discontinuous*.

- 手術_{other} 前にくらべ 体重_{disorder} が8キロ 増加_{disorder} しました
[My weight_{disorder} has increased_{disorder} by 8 kg compared to before the surgery_{other} .]

“8キロ (8 kg)” also splits the “体重が増加 (my weight has increased)” in this case, resulting in a discontinuous annotation