Physician Intent Annotation Guidelines

Your task is to annotate medical intents in a doctor's utterance from a doctor-patient conversation. In the conversation the patient visits a doctor for some sort of complaint. Via multiple turns the doctor tries to assess the cause of the complaint and create a diagnosis. In general, each conversational turn in the data consists of the doctor asking a question and the patient answering said question. With each question asked the doctor follows some kind of intent to refine the assessment.
Given the annotation space of multiple intents, your task is to annotate each doctor utterance with at least <u>one or more</u> intents.
The presence of the patient utterance is for the sake of completeness of the sample. <u>The intents should only be derived from the doctor's utterance.</u>
You will also be able to annotate a utterance as *chitchat*, if it holds no necessary information.

The conversations are obtained from: https://www.nature.com/articles/s41597-023-02487-3

Data Information

The following snippet is an excerpt of an example dialogue:
```
--------------------------------EXAMPLE DIALOGUE----------------------------------
----------------------------------------------------------------------------------
[doctor] hi elizabeth so i see that you were experiencing some kind of injury did
you say that you hurt your knee
[patient] yes i hurt my knee when i was skiing two weeks ago
[doctor] okay skiing that sounds exciting alright so what happened what what's when
did the injury like what sorry what happened in the injury
[patient] so i was flying down this black diamond you know like i like to do
[doctor] yes
[patient] and this kid who was going faster than me spent by me so then i tried to
speed past them and then i ran into a tree and twisted my knee
--------------------------------EXAMPLE DIALOGUE----------------------------------
----------------------------------------------------------------------------------
```

One sample is defined as a single doctor-patient turn. Thus, the above snippet includes three samples in total.
```
---------------------------EXAMPLE SAMPLES----------------------------------------
----------------------------------------------------------------------------------
[doctor] hi elizabeth so i see that you were experiencing some kind of injury did
you say that you hurt your knee
[patient] yes i hurt my knee when i was skiing two weeks ago
--------------------------------SAMPLE 1-------------------------------------------
[doctor] okay skiing that sounds exciting alright so what happened what what's when
did the injury like what sorry what happened in the injury
[patient] so i was flying down this black diamond you know like i like to do
--------------------------------SAMPLE 2-------------------------------------------
[doctor] yes
[patient] and this kid who was going faster than me spent by me so then i tried to
speed past them and then i ran into a tree and twisted my knee
--------------------------------SAMPLE 3-------------------------------------------
----------------------------------------------------------------------------------
```

Annotation Classes

The annotation classes in this task are doctoral intents. There are 20 medical intents in total. Our annotation scheme follows the SOAP principal, in which we subcategorize each intent into **S**ubjective, **O**bjective, **A**ssessment and **P**lan.
In the following we introduce all intent classes with a few examples from the data.
This is a multi-label annotation task. One doctor-patient turn can be associated with multiple intents. Even though the following examples showcase individual intents, they can include more than just the one intent it tries to explain. Thus, the doctor's utterance which dictates the current intent to be showcased will be underlined.

Subjective Intents

The following will introduce the subjective intentions. The subjective intents revolve around the doctor trying to frame an image around the patient, by asking questions relating to the symptomatics of the current complaint. Each intent will be accompanied by at least one example utterance.

Acute Symptoms

In an "acute symptom(s)" intent a doctor assesses the <u>current symptoms</u> of the patient. This intent is characterized by direct questions about the symptomatic or follow-up questions about symptoms the patient describes. It is one of the more common intents and usually present at the start of a conversation.

```
---------------------------EXAMPLE SAMPLES----------------------------------
----------------------------------------------------------------------------
[doctor] hi elizabeth so i see that you were experiencing some kind of injury did
you say that you hurt your knee
[patient] yes i hurt my knee when i was skiing two weeks ago
----------------------------------------------------------------------------
[doctor] okay . and , have you noticed any , like , symptoms of weight gain , like
, like swollen legs , or , you know , your belly feels bloated and things like
that?
[patient] i feel , i feel bloated every once in a while .
----------------------------------------------------------------------------
[doctor] okay . all right . um , how long has that been going on for ?
[patient] uh , probably since labor day , so about five weeks or so .
----------------------------------------------------------------------------
----------------------------------------------------------------------------
```

Personal History

The "personal history" intent includes all questions related to <u>previous medical events</u> of the patient. This also includes questions directed towards chronic illnesses like diabetes or measuring of the heart rate.
This intent additionally captures questions asked about symptoms in the past that might relate to the current complaint.
The diet of a patient is also part of the "personal history" intent.

```
-----------------------------EXAMPLE SAMPLES-------------------------------------
---------------------------------------------------------------------------------
[doctor] so , brian is a 58 year old male with a past medical history significant
for congestive heart failure and hypertension , who presents today for follow-up of
his chronic problems . so , brian , it's been a little while i've seen you .
[patient] mm-hmm .
---------------------------------------------------------------------------------
[doctor] how were you doing with your heart failure ? i know that we've kinda
talked about you being able to watch your healthy food intake and that's been kind
of a struggle in the past .
[patient] i , i , i've actually been pretty good about that ever since . the , the
, the last year , it's been a little chaotic , but i wanted to make sure i stayed
on top of that
---------------------------------------------------------------------------------
[doctor] okay and i know you were mentioning a cough before how is it as far as
walking are you having any shortness of breath
[patient] i have n't noticed any shortness of breath it just kind of seems to be a
lingering kind of light dry cough
---------------------------------------------------------------------------------
[doctor] how are you doing with your diet ?
[patient] um , been pretty good t- taking my medications , watching my diet ,
trying to , uh , trying to exercise regularly , too .
---------------------------------------------------------------------------------
[doctor] you may wan na check that but okay so that's good but i what i'd like you
to do with that is i'd like you to keep a record of them for me for my next visit
with you so let's talk a little bit about your diet tell me how how is your diet
what what are the what kind of foods do you like what do you eat normally
[patient] alright do you want the honest answer
---------------------------------------------------------------------------------
---------------------------------------------------------------------------------
```

Differentiation between Acute Symptoms and Personal History

There are samples in which the distinction between the "acute symptoms" and "personal
history" may not be clear at first. Most of the time the context of the sample in the dialogue
indicates, if the doctor refers to an acute symptom or a personal history case.
Given sample:

```
[doctor] just the knees . and have you noticed any swelling of your knees , or any
redness of your knees ?
[patient] uh , they look a little inflamed in the morning , and then in the
afternoon , same but not as bad , not as noticeable .
```

Without the context one may annotate this sample as a personal history intent. But looking at
the previous turns we can see, that the doctor asks about the acute symptoms:

```
[doctor] okay . and , um , does it hurt more in the morning when you wake up , or
does it hurt more when you're walking around and that type of thing ?
[patient] usually when i get up in the morning , they're pretty stiff and sore ,
and then by the end of the day , i start to feel that same sensation . kind of
pretty much , like , uh , probably around dinner time or so .
[doctor] okay . and any other , any other joints bothering you , your elbows ,
wrists , shoulders , anything like that ?
[patient] no , it's just the knees .
```

Another indication of when to choose what is the flow of the conversation in general. Most of the time a doctor tries to assess the acute symptoms in the beginning of a conversation before it switches to assessing the personal history.

There are samples in which a patient visits the doctor for an annual exam or a follow-up. For those cases we the doctor starts with assessing the personal history first and then may switch towards asking for acute symptoms in specific cases.

Family History

This intent assesses medical events in the family of the patient. These samples often include direct questions towards similar symptoms in relatives.

```
-----------------------------EXAMPLE SAMPLE------------------------------------
-------------------------------------------------------------------------------
[doctor] okay how about any family history of any gynecological cancers
[patient] i was adopted
-------------------------------------------------------------------------------
[doctor] okay . and is there any family history of gi cancer or liver disease ?
[patient] nope .
-------------------------------------------------------------------------------
[doctor] but what about at home how about your siblings are any of them sick
[patient] most of them are healthy yeah most of them are healthy although you know
i have a brother who smokes i have told him not to smoke he does n't listen
-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
```

Drug History

The "drug history" intent captures the consumption of drugs by the patient currently or in the past. Everything besides regulated medication we consider as drugs.

This includes alcohol, caffeine, nicotine, cannabis and all other "harder" drugs.

```
-----------------------------EXAMPLE SAMPLE------------------------------------
-------------------------------------------------------------------------------
[doctor] wonderful . do you have any history of smoking , illicit drug use , heavy
alcohol consumption ?
[patient] no drugs . i do drink socially , but never more than that . and i used to
smoke , but really , everybody did back then and i probably quit about 30 years ago
-------------------------------------------------------------------------------
[doctor] okay do you use any other type of tobacco products
[patient] no smoking is enough
-------------------------------------------------------------------------------
[doctor] okay . and no previous history of heavy alcohol or drug use ?
[patient] nope .
-------------------------------------------------------------------------------
[doctor] so what about alcohol use is that something that you used to do a lot
[patient] i did i did i mean i i still have a beer here and there everyday but not
as much as i used to
-------------------------------------------------------------------------------
[doctor] . so then ... you're welcome . and so do you use any tobacco , drugs , or
alcohol ? and then , um , you said that you were going to school . what are you
going to school for ?
[patient] uh , i drink a little wine on occasion , and for school , i'm currently
studying psychology .
-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
```

Therapeutic History

The "therapeutic history", aka "medication history", intent occurs when a doctor asks for information regarding medications or therapies the patient applied in the past or is actively consuming.

```
----------------------------EXAMPLE SAMPLE----------------------------------
----------------------------------------------------------------------------
[doctor] good i was just gon na ask you if you were taking your lisinopril so
that's good okay and any side effects from the lisinopril since we started it i
think we started it about a year ago two years ago
[patient] no no no side effects that i'm aware of
----------------------------------------------------------------------------
[doctor] okay do you take any oral hormone replacement therapy
[patient] no
----------------------------------------------------------------------------
[doctor] yes . what do you do for your acne in the morning ? and then what do you
do at nighttime ?
[patient] i wash my face , more like i wipe it down in the morning . then at night
i use an elf facial cleanser called the super clarity cleanser . i finish with a
toner and then the persa-gel .
----------------------------------------------------------------------------
[doctor] okay have you tried icing
[patient] yes
----------------------------------------------------------------------------
----------------------------------------------------------------------------
```

Vegetative History

The "vegetative history" intent describes questions towards the internal body functions of a patient. For example it captures instances in which the doctor asks about the fatigueness and general questions regarding the review of system.

```
----------------------------EXAMPLE SAMPLE----------------------------------
----------------------------------------------------------------------------
[doctor] yes . okay . and any fatigue ? weight gain ? anything like that that
you've noticed ?
[patient] no , nothing out of the ordinary .
----------------------------------------------------------------------------
[doctor} any other symptoms i might be missing ? nausea or vomiting , diarrhea ?
[patient] no .
----------------------------------------------------------------------------
[doctor] okay and how about any nausea or vomiting
[patient] no not as of today
----------------------------------------------------------------------------
[doctor] okay , all right . um , okay . well , i know that the nurse did a review
of system sheet when you came in . and we've just talked a lot about your , your s-
your symptoms , you know , your dizziness , your fatigue and that type of thing .
anything else that i might have missed , fever chills , any nasal congestion , sore
throat , cough ?
```

```
[patient] uh , i've had a little bit of nasal congestion just because with the
seasons changing , i , i get seasonal allergies . but everything else has been
okay.
--------------------------------------------------------------------------------
[doctor] okay . all right . and any other symptoms like muscle aches , joint pain ,
fatigue ?
[patient] my elbows hurt quite a bit and my knees were pretty tired . l- like i
said , i really felt some tension around my knees , but , uh , i think that was a
lot to do with , uh , lifting the bags .
--------------------------------------------------------------------------------
--------------------------------------------------------------------------------
```

Other Socials

The "other socials" intent is in usage as an umbrella intent to capture information relating to the current social status a patient inherits or any other factors that affect the patient from the outside. This includes questions towards kids, marriage, job, living situation, social support systems, sports etc.

```
----------------------------EXAMPLE SAMPLE-------------------------------------
--------------------------------------------------------------------------------
[doctor] okay . and do y- do you have a good support system at home ?
[patient] yes , i do . i have my husband and , uh , my kids are right down the
street from me , so i'm very lucky .
--------------------------------------------------------------------------------
[doctor] okay . and , and so how has work going for you ?
[patient] it's been okay . it's been a lot of long hours , late nights . a lot of ,
um , you know , fiscal year end data that i've been having to pull . so , a lot of
responsibility , which is good . but with the responsibility comes the stress .
--------------------------------------------------------------------------------
[doctor] did you play any sports when you were younger
[patient] no anything you can think of primarily it was basketball baseball and
football
--------------------------------------------------------------------------------
--------------------------------------------------------------------------------
```

Objective Intents

This section introduces the objective intents. The doctor's intent is to assess the current symptomatics of a patient with physical examination or the examination of lab results and imagery, like x-rays.

Physical Examination

The "physical examination" intent is the doctor doing physical tests with the patient. This intent is mostly straight-forward, given that the doctor has to ask for permission to do physical tests.

```
-----------------------------EXAMPLE SAMPLES-----------------------------------
-------------------------------------------------------------------------------
[doctor] okay there is pain to palpation of the right anterior knee and i'm just
gon na bend your knee up and down does that hurt at all
[patient] no no it's just more of the typical grinding that i would feel
-------------------------------------------------------------------------------
[doctor] no ? okay . all right . well , i wan na go ahead and do a quick physical
exam , okay ?
[patient] okay .
-------------------------------------------------------------------------------
[doctor] hey , dragon , show me the vital signs . so here in the office , you know
, your blood pressure looks really good , as does your heart rate . so you are
doing a good job managing your blood pressure . so i'm gon na take a listen to your
heart and lungs , okay ?
[patient] okay .
-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
```

Lab Examination

With the "lab results" intent a doctor is evaluating measurements done in a lab. Indications for this intent is the doctor referring to some external evidence regarding the symptoms of the patient.

```
-----------------------------EXAMPLE UTTERANCES--------------------------------
-------------------------------------------------------------------------------
[doctor] okay your blood sugars are running below
[patient] it's it's probably with with with the metformin it seems to be you know
one twenty
-------------------------------------------------------------------------------
[doctor] let's take a look at some of your results . hey , dragon , show me the
autoimmune panel . hey , dragon , show me the autoimmune labs . okay . so looking
at your autoimmune panel here , you know , we sent that because , you know , you're
young and you have , you know , arthritis and gout and that type of thing and
everything seemed to be fine .
[patient] okay .
-------------------------------------------------------------------------------
[doctor] uh , let's look at some of your labs , 'cause i know that you have the
diabetes . hey dragon , show me the labs . so , here your white blood cell count is
not elevated , so i'm not concerned about an infection or anything like that . um ,
hey dragon , show me the diabetes' labs . okay and , and your a1c is a little
elevated , but it's not , it's not terrible , so i think for right now we'll just
continue you on the current regimen . um , so my plan from you , for you in terms
of the joint pain , um , i'd like to go ahead and , you know , we'll just send some
autoimmune labs to work , work up your left knee pain and , uh , we'll work for you
```

to do some physical therapy and i'd like to go ahead and give you anti-inflammatory medication to help with the pain . does that sound okay ?
[patient] that sounds great .

Radiology Examination

The "radiology results" intent follows the evaluation of screening results for the patient. Screening procedures include x-ray, mrt, echocardiogram etc…

------------------------------EXAMPLE SAMPLES-------------------------------------
----
[doctor] hey , dragon ? show me the chest x-ray . so , looking here at the results of your chest x-ray , it does look like you have a little bit of fluid in your lungs there , and that can be just from , um , your heart failure , okay ? hey , dragon ? show me the echocardiogram . so , this is the echocardiogram that we did about four months ago , and this shows that the pumping function of your heart is a little bit reduced at 45 % , and it also shows that leaky valve , the mitral regurgitation that , that you have , okay ? um , so , let me just go over and talk about , a little bit , my assessment and my plan for you .
[patient] mm-hmm .

[doctor] along with this history of your congestive heart failure . but , let's go ahead and look at some of your results . hey , dragon , show me the ecg . so , this is , uh , a s- a stable ecg for you . this basically shows that you have some left ventricular hypertrophy which caused your congestive heart failure . um , let's go ahead and review your echocardiogram . hey , dragon , show me the echocardiogram . so , in reviewing the results of your echocardiogram , it shows that your pumping function of your heart is a little low , uh , but it's stable . and , you know , i think that we know this and we have you on the appropriate-
[patient] mm-hmm .

[doctor] okay alright well let's do a quick physical exam here so your vital signs your blood pressure looks pretty good today at one twenty eight over seventy two your temperature is ninety eight . seven and your heart rate is seventy two your respirations are eighteen your oxygen saturation looks pretty good at at ninety six percent okay now on your neck exam there is no jugular venous distention on your heart exam i appreciate a two over six systolic ejection murmur which i've heard before and so it's stable and your lungs are clear bilaterally and your lower extremities show just trace edema now now we since we did the echocardiogram i reviewed those results and it does show a preserved ef of fifty five percent abnormal diastolic filling and mild-to-moderate mitral regurgitation so let me tell you a little bit about my assessment and plan so for your first problem for your congestive heart failure it sounds like this was caused by dietary indiscretion and some uncontrolled hypertension so i want you to continue on your bumex two milligrams once daily continue to watch your diet and avoid salty foods might try keeping that log we talked about with your blood pressures and what you've eaten if if your blood pressure seems a little high also weigh yourself daily and call me if you gain three pounds in two days okay
[patient] okay

Assessment Intents

This section will introduce the Assessment intents. This intent is characterized by the doctor summarizing the findings to a conclusion and ultimately into a diagnosis.

There are two types of assessment intent. The first is the "acute assessment". This type is present when the doctor refers to the assessment of the current complaint by the patient. The second type "reassessment" describes an assessment in which the doctor refers to already known diagnoses. For example in cases of chronic illnesses like diabetes or asthma. An assessment intent is given for utterances, in which the doctor summarizes the subjective and objective finding into a final diagnosis. This usually appears towards the later stages of a conversation.

Acute Assessment

The intent of the doctor for the "acute assessment" is to summarize the findings into a conclusive primary diagnosis for the current complaint the patient has.

```
-----------------------------EXAMPLE SAMPLES------------------------------------
--------------------------------------------------------------------------------
[doctor] okay ? so , for your first problem , your congestive heart failure , i
think you're retaining fluid , and i wan na go ahead and increase your lasix to 80
mg once a day .
[patient] mm-hmm .
--------------------------------------------------------------------------------
[doctor] and so you you've got some arthritis in there we we call this hallux
rigidus and treatment for this to start off with we we put an insert in your shoe
called an orthotic and we give you a little bit of anti-inflammatory medication or
like a drug called meloxicam you only have to take it once a day
[patient] oh
--------------------------------------------------------------------------------
[doctor] hey , dragon , show me the echocardiogram . so , i just wanted to go over
the results of your last echocardiogram , that was about six months ago . that
shows that you do have the low pumping function of , of your heart at about 45 % ,
which is not terrible . and it does show that you have some moderate mitral
regurgitation . so , that's that slight heart murmur i heard in your exam , okay ?
hey , dragon , show me the hemoglobin . and here , this is the hemoglobin that i
was referring to . it's low at 8.2 , okay ? so , we'll have to talk a little bit
about that , all right ? so , let me go over a little bit about my assessment and
my plan for you , okay ? so , for you first problem this new anemia , uh , i wan na
go ahead and send off some more labs and anemia profile , just to see exactly what
type of anemia we're dealing with . i also wan na go and refer you back to the
gastroenterologist for another evaluation , okay ? hey , dragon , order referral to
gastroenterology . so , they're gon na do , uh , probably do an endoscopy and
another colonoscopy on you . um , but again , i wan na send off those labs just to
make sure that it's not something else , okay ?
[patient] okay .
--------------------------------------------------------------------------------
doctor: okay and then lastly for the painful swallowing that you're having so the
inflammation you're having it not only in your lungs but it also in your esophagus
as well so what i'm gon na do is prescribe you you're taking the the prednisone i'm
also gon na give you a lidocaine swish and swallow and you can do that four times a
day and so that will be able to help you so you can eat immediately after taking it
and it can also help so that you can continue to take food and fluids prevent
dehydration and any further weight loss
patient: great
--------------------------------------------------------------------------------
```

[doctor] <u>you also have multiple benign moles on your arms , legs , back and abdomen . this means they all look normal with no worrisome features .</u> we will see if you have any progress over the next six months and follow up at that time .
[patient] okay , that sounds good . thank you .

[doctor] alright so you are positive for pain with resistance against flexion of that left wrist so i let let's go ahead and review the x-ray that we did of your elbow the good news is i do n't see any fracture or bony abnormality of that right elbow which is good so let's talk a little bit about my assessment and plan for you <u>so for the problem with elbow pain i do believe that this is consistent with medial epicondylitis which is caused by the overuse and potential damage of those tendons that bend that that bend the wrist towards the palm</u> now i want you to rest it i'm gon na order a sling and i want you to wear the sling while you're awake now we're also gon na have you apply ice to the elbow for twenty minutes three times a day and i want you to take ibuprofen that's gon na be six hundred milligrams q.6 h. with food and i want you to take that for a full week now you're not gon na like this part but i want you to hold off for the next couple of weeks on doing any type of pottery work okay alright now what i wan na do is i wan na see you again in a week and i wan na see how you're doing okay
[patient] alrighty

Reassessment

The "reassessment" intent captures every assessment towards diagnoses that are not novel for the patient. This is the cases for chronic illnesses and follow-up visits.
----------------------------EXAMPLE SAMPLES-------------------------------------
----
[doctor] great and then<u> for your third problem of your diabetes</u> i wan na just go ahead and order a hemoglobin a1c and continue you on the metformin one thousand milligrams twice a day it sounds like you're doing a good job since your blood sugars are running in the one twenties i do n't think we need to make any adjustments but we'll see what the hemoglobin a1c shows that gives us a an idea of what your blood sugars are doing on a long-term basis how does that sound
[patient] okay at what point time do you start kinda checking kidney function i've been told that metformin can possibly cause some kidney issues
----
[doctor] so i'm not too concerned about that , that chest pounding . hey , dragon , show me the chest x-ray . and we also did a chest x-ray , which , which looks really good , uh , and you know , your prior lobectomy , there's no ... everything looks good , okay ? it looks normal . so let's talk a little bit about my assessment and my plan for you . so for your first problem , your , your depression , it seems , again , like you're doing really well-
[patient] mm-hmm .

[doctor] hey dragon , show me the blood pressure . okay , so here in the office today it is a little bit elevated , okay ? so your blood pressure is a little bit high . so the results , um , do show that . um , hey dragon , show me the labs . okay , so good news is is your- your labs are all essentially normal , so the results of your labs are essentially normal , okay ? so ... um , <u>my assessment is that your- ... you do have hypertension still</u> . um , and i think we need to increase your blood pressure medicine a little bit , okay ? so i'm gon na increase your lisinopril to 10 milligrams a day , just once a day , um , but i'm gon na increase that a little bit , okay ? and then want you to check it and i'm gon na have you come back in a month and we'll see how you're doing with regards to that , okay ?
[patient] okay

Plan Intents

This section will introduce the Plan Intents. In these intents the doctor formulates directions for the patient to solve the complaints for the visit. A plan can be versatile and include multiple suggestions, for example doing imagery, taking lab results, prescribing medication or observing the current status.

<u>Medication</u>
In this intent the doctor prescribes the patient the intake of medications.
```
----------------------------EXAMPLE SAMPLES----------------------------------
-----------------------------------------------------------------------------
[doctor] okay ? so , for your first problem , your congestive heart failure , i
think you're retaining fluid , and i wan na go ahead and increase your lasix to 80
mg once a day .
[patient] mm-hmm .
-----------------------------------------------------------------------------
[doctor] yeah so so we are gon na start you on some antibiotics to help help you
with this you know possible lyme disease and i'm gon na just order some blood tests
just to see exactly what's going on and then you know sometimes people need
intravenous antibiotics because lyme disease can cause problems on other organs
like your heart that type of thing
[patient] ok .
-----------------------------------------------------------------------------
[doctor] okay that's understandable alright so for the last issue for the insomnia
i'm just gon na have you take ten milligrams of melatonin as needed
[patient] okay
-----------------------------------------------------------------------------
-----------------------------------------------------------------------------
```

<u>Diagnostic Testing</u>
The "diagnostic testing" intent refers to the doctor ordering any kind of additional medical test to further assess the situation of the patient. This includes lab work (blood results etc.), imagery (mrt, ecg, x-ray etc.) and measuring blood pressure as well.
```
----------------------------EXAMPLE SAMPLES----------------------------------
-----------------------------------------------------------------------------
[doctor] and , i certainly want you to call me if you have any other symptoms of
shortness of breath , and i wan na go ahead and order another echocardiogram ,
okay?
[patient] sure .
-----------------------------------------------------------------------------
[doctor] and for your third problem , for an annual exam maintenance , you know ,
you're due for a mammogram , so we'll go ahead and schedule that , okay ?
[patient] all right .
-----------------------------------------------------------------------------
doctor: . and i wan na go ahead and order another hemoglobin a1c in a couple weeks
, or , i'm sorry , a couple months . patient: okay .
-----------------------------------------------------------------------------
[doctor] well , i think since it's been about four months since your blood work was
done , we should check your liver enzymes in addition to a few other labs .
[patient] okay . and then what ?
-----------------------------------------------------------------------------
[doctor] okay alright well let's do a quick physical exam here so your vital signs
your blood pressure looks pretty good today at one twenty eight over seventy two
your temperature is ninety eight . seven and your heart rate is seventy two your
respirations are eighteen your oxygen saturation looks pretty good at at ninety six
```

percent okay now on your neck exam there is no jugular venous distention on your heart exam i appreciate a two over six systolic ejection murmur which i've heard before and so it's stable and your lungs are clear bilaterally and your lower extremities show just trace edema now now we since we did the echocardiogram i reviewed those results and it does show a preserved ef of fifty five percent abnormal diastolic filling and mild-to-moderate mitral regurgitation so let me tell you a little bit about my assessment and plan so for your first problem for your congestive heart failure it sounds like this was caused by dietary indiscretion and some uncontrolled hypertension so i want you to continue on your bumex two milligrams once daily continue to watch your diet and avoid salty foods <u>might try keeping that log we talked about with your blood pressures and what you've eaten if if your blood pressure seems a little high</u> also weigh yourself daily and call me if you gain three pounds in two days okay

[patient] okay

Follow-up

With this intent the doctor orders a follow-up to check for persistent symptoms or changes due to given medications.

------------------------------EXAMPLE UTTERANCES---------------------------------
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[doctor] you also have multiple benign moles on your arms , legs , back and abdomen . this means they all look normal with no worrisome features . <u>we will see if you have any progress over the next six months and follow up at that time .</u>

[patient] okay , that sounds good . thank you .

[doctor] okay . um , <u>i'm gon na be in touch with you after we get your test results , and we'll go from there , okay ?</u>

[patient] sure .

Discussion

This intent aims to give the patient an opportunity to ask questions or clarify questions by the patient. It is also about discussing the usage of treatments and their circumstances.

------------------------------EXAMPLE UTTERANCES---------------------------------
----

[doctor] all right . hey , dragon , show me the ekg . and the nurses did an ekg before you came in , and that looks perfectly fine , okay ? so i wan na just go ahead and talk a little about your assessment and my plan for you . so for your first problem , your depression , <u>i think you're doing a really good job with your strategies . i do n't think ... it does n't sound to me like i need to start you on any medication at this time , unless you feel differently .</u>

[patient] no , i'm , i'm , good in that department .

[doctor] <u>so it can you know your kidney function we've you know i think you've been really lucky it's been normal i checked it about two months ago and it looks pretty good it looks pretty normal</u> but since we're doing blood work on you i can go ahead and order a a basic metabolic panel just to make sure that your kidney function is stable

[patient] okay that'd be good

[doctor] <u>that would be surgery if if we went in and cleaned out the joint sometimes in really severe cases we even just have to fuse the big toe joint we put it in a position of optimal function and we fuse it there and then your pain goes away you</u>

lose some motion but you've already lost quite a bit of motion and and the pain
goes away so that that surgery really is very effective but let's try to run from
my knife a little bit longer
[patient] ok .

Is it a discussion or a plan?

At first the discussion intent may seem ambiguous, since it correlates with other plan intents. Rule of thumb to discern a discussion intent from another plan intent is to assess, if the doctor's utterance includes an order. If the doctor is just explaining a procedure or a referral instead of actually ordering said procedure or referral for the patient, the utterance belongs to the *Discussion* intent.

Referral

The "referral" intent is apparent when a doctor plans to refer the patient to another specialist. This can include many professions, like an ophthalmologist or cardiologist, but can also include referral for physical therapy.

------------------------------EXAMPLE SAMPLES------------------------------------
----
[doctor] well , mr. walker , overall you're doing well . i'm going to order an
echocardiogram and a stress test . i also recommend that you follow up with
cardiology , i think dr. vincent sanchez would be a great fit for you .
[patient] all right .

[doctor] you know , let's see how we do over the next couple weeks , and again ,
we'll refer you to physical therapy if we need to , okay ?
[patient] you got it

[doctor] okay . hey , dragon , order physical therapy referral . and then in terms
of your depression , we talked about increasing your prozac , so we'll increase it
from 20 milligrams to 40 milligrams . it's just one tablet once a day .
[patient] okay .

Other Treatments

We can not cover all types of treatments specifically. This intent covers those that are not specifically mentioned in this document. This mainly includes prescriptions of orthopedic devices such as crutches or slings, suggestions towards a better diet, and surgery.

------------------------------EXAMPLE SAMPLES------------------------------------
----
[doctor] alright and then you're going to also be given an aircast which is really
gon na help stabilize the ankle and then you also be given some crutches for the
next one to two days and then you may start walking on it as tolerated
[patient] alright

[doctor] i want you to continue on the omeprazole , 40 milligrams , once a day and
continue with those dietary modifications . um , for your second problem , your
gout , um , you know , everything seems controlled right now . let's continue you
on the allopurinol , 100 milligrams , once a day . um , do you need a refill of
that ?
[patient] yes , i do actuall

[doctor] and for your last problem your kidney stones , uh , i think everything
seems to be fine right at this time . again , continue to watch your diet and stay

hydrated . um , and i know that might be a little difficult with the diuretic , but do your best . uh , and give me a call if you have any question , okay ?
[patient] okay

[doctor] so assuming that the ultrasound is normal , the treatment for you melanoma is to cut out the area where the lesion was . with lesions that are 0.7 millimeters or less , um , and that's what we recommend , and yours was exactly 0.7 millimeters . if it were any bigger , we would have had to do a more complex surgery . but what i recommend for you is what we call a wide local incision , excuse me , excision , meaning that i will make a long incision and then cut out an area a bit wider than your current biopsy site . the incision is long because that's what allows me to close the skin nicely . you'll have a fairly long scar from the incision .
[patient] okay , that is fine with me , i ca n't see back there anyways .

Multiple intents per sample

Medical intent classification is a multi-label classification task, thus one doctor-patient turn can be annotated with multiple different intents. Especially in the later stages of the conversation, where the doctor concludes or discusses the diagnosis. The following sample is an example in which the doctor evaluates the diagnostic and instantly follows with an assessment and a plan.

[doctor] okay so do you mind getting up and walking for me really quickly alright so i do notice that there is a slight gait like there is a small sorry you are correcting you do have a limp i i am a little worried about that but it's probably it's probably the superficial when i'm looking at your knee i do notice some like ecchymosis and edema that just means bruising and swelling along the lateral aspect of your knee i do n't notice any effusion and it looks like you have a decent range of motion but i do understand that you know you are experiencing pain with some movement okay i'm gon na go ahead and order an x-ray and when you come back we can have that discussion alright so i reviewed the results of your right knee x-ray which showed no evidence of fracture or bony abnormality so let's talk about my assessment and plan alright so for your first problem of right knee pain i think you have a lateral a lateral ligament strain i wan na prescribe some meloxicam which is gon na be fifteen milligrams daily for pain and swelling i'm gon na refer you to physical therapy to help strengthen the muscles around the area and to prevent further injury if you're still having pain we can do further imaging imaging but like this is a common injury that tends to heal on its own for your second problem with hypertension i wan na continue the lisinopril at twenty milligrams and order an echo i am concerned that we might not be getting your blood pressure to where we need it to be so we might have to do some medication modification for your third problem with diabetes i wan na order an a1c i know that you said you have been measuring your blood sugars but i think this would give us a better image of what's been happening long term and i also wan na order a lipid panel in case we need to make any adjustments to that medication as well do you have any questions
[patient] sounds good

The intents for this sample are: [Objective] *Physical Examination*, [Objective] *Radiology Examination,* [Assessment] *Acute Assessment,* [Assessment] *Reassessment,* [Plan] *Medication,* [Plan] *Referral,* [Plan] *Diagnostic Testing,* [Plan] *Discussion*
As you can see by the color coding in the doctor's utterance, multiple intents are present.

Furthermore, please keep in mind that the examples for the intents above may also include multiple intents and not only the intent the example explains.

Additional Annotation Classes

Besides the intent annotation classes there are additional annotation classes that help to further dissect the conversation and to assess the certainty of the annotators for the samples.

Chitchat

The use of this class is to determine if the utterance holds any value for a medical note or is just chit-chatting between doctor and patient. The purpose of this class is to be able to filter these utterances later on to only supply beneficial information for the system.
Utterances are also chit-chat, if the utterances in itself is a repetition of things already discussed in the dialogue. For example the patient does not understand the doctor and has to ask again.

```
-----------------------------EXAMPLE SAMPLES-------------------------------------
---------------------------------------------------------------------------------
[doctor] it's good to see you too . so , i know the nurse told you a little bit
about dax .
[patient] mm-hmm .
---------------------------------------------------------------------------------
[doctor] okay anything else
[patient] not that i can think of at this time as soon as i leave
---------------------------------------------------------------------------------
[doctor] okay . all right . are you excited for halloween ?
[patient] uh , ca n't wait .
---------------------------------------------------------------------------------
---------------------------------------------------------------------------------
```

Greetings

This class assigns to the greeting at the start of most of the conversations. It is pretty straight-forward and usually is the first turn between a doctor and a patient.

```
-----------------------------EXAMPLE SAMPLES-------------------------------------
---------------------------------------------------------------------------------
[doctor] hi , andrew , how are you ?
[patient] hi . good to see you .
---------------------------------------------------------------------------------
[doctor] hey joshua good to see you today so take a look at your chart here brenda
and i see that you're coming in you you have i think you have a kidney stone so can
you tell me what's going on how are you feeling and you're my my patient
[patient] and i'm your patient yeah
---------------------------------------------------------------------------------
[doctor] hey , ms. hill . nice to see you .
[patient] hi , dr. james , good to see you .
---------------------------------------------------------------------------------
---------------------------------------------------------------------------------
```

Reversed Roles/Faulty Sample

In some cases in the data, the roles for the doctor and patient are tagged wrong. Sentences said by the doctor are flagged as patient utterance and the other way around.

```
----------------------------EXAMPLE UTTERANCES--------------------------------
------------------------------------------------------------------------------
[doctor] no i do n't that's the thing i do n't remember an injury if it was
something that i injured i think i would have just ignored it and would n't have
showed up here but when it got red and warm to touch that's when i i was really
concerned
[patient] okay do does even light pressure to it bother it like at night when
you're laying in bed do the sheets bother
------------------------------------------------------------------------------
------------------------------------------------------------------------------
```

Certain

This annotation should be used, if the annotator is certain with their decision.

Uncertain

Opposing the "certain" annotation, the "uncertain" annotation is used by annotators when they are unsure with their decision.

We are then able to filter for uncertain annotations and fix them.

Please always annotate if you're *certain* or *uncertain*.

Context span annotations

The data you annotate resembles dialogues captured by multiple means. It is by nature messy. Alongside flagging reversed roles or faulty samples an additional annotation task is to annotate correct context spans.

The main idea behind this annotation class is to determine samples that may be chit-chat on their own, but are very important in terms of context. By adding these annotations we are able to keep utterances that span over multiple turns and build stronger contexts.

The samples you will annotate are in sequential order.

Start-Context

Indicates the beginning of a context span. These indicate changes of topic in the dialogue.

Inside-Context

Indicates that an utterance is part of a topic that started in a previous utterance.

Following is an example of utterances of a dialogue with their respective context annotations.

```
-----------------------------EXAMPLE SAMPLES-------------------------------------
-----------------------------Start-Context-----------------------------------
[doctor] okay alrighty so taking a look at your x-ray and you do have you you have
a large spur there on the top of your big toe joint
[patient] oh.
-----------------------------Inside-Context----------------------------------
[doctor] and you've lost a lot of the cartilage
[patient] oh .
-----------------------------Inside-Context----------------------------------
[doctor] and so you you've got some arthritis in there we we call this hallux
rigidus and treatment for this to start off with we we put an insert in your shoe
called an orthotic and we give you a little bit of anti-inflammatory medication or
like a drug called meloxicam you only have to take it once a day
[patient] okay.
-----------------------------Inside-Context----------------------------------
[doctor] it's usually pretty well tolerated have you ever had any trouble with your
stomach
[patient] no never never had any problems with my stomach i love the i love the
mexican's food the hotter the better so i hope i never get a problem with my
stomach
-----------------------------Inside-Context----------------------------------
[doctor] i hope you do n't either one of the things that we get concerned about
with an anti-inflammatory like that is that it can irritate the stomach so if you
do start to notice that you're getting heartburn or pain right there
[patient] yeah .
-----------------------------Inside-Context----------------------------------
[doctor] below your sternum you would need to stop taking the medicine and
give me a call patient: okay
-----------------------------Chit-chat---------------------------------------
[doctor] okay
[patient] okay
-----------------------------Start-Context-----------------------------------
[doctor] and i wan na see you back in two weeks to see how you're doing with that
if you're not seeing significant improvement then we may have to talk about doing
things that are a little more invasive like doing a shot
[patient] okay.
-----------------------------Inside-Context----------------------------------
[doctor] or even surgery to clean out the joint sometimes
[patient] is that surgery ?
```

```
-------------------------Inside-Context/Chit-chat-----------------------------
[doctor] i have to
[patient] would that be
-------------------------Inside-Context/Chit-chat-----------------------------
[doctor] i'm sorry
[patient] would that be surgery clean out the joint
-------------------------------Inside-Context---------------------------------
[doctor] yeah that would
[patient] okay
------------------------------------------------------------------------------
------------------------------------------------------------------------------
```

In this excerpt of a dialogue the doctor and patient discuss an x-ray examination and possible treatments. There is one topic change in the middle when the doctor switches between discussing the assessment to planning a potential surgery.

Additionally inside this example there are cases of chit-chat, where utterances are repeated, thus not providing beneficial information.

Summary & Tips

You know now all intent and additional annotation classes and should be able to annotate each sample with at least one intent.

Keep in mind that a sample can be annotated with more than one intent. Especially in the assessment and plan sections of a dialogue.

The doctors can mix in multiple different assessments and plans into one utterance. Don't hesitate to annotate accordingly, if you have the feeling multiple annotations can apply.

Also, a dialogue can have multiple assessment utterances. It is not always the case that one utterance captures the diagnosis assessment. There are cases where the diagnosis spans over multiple utterances, or is clarified over multiple turns.

You are allowed to annotate accordingly.

If a sample is faulty, like no full doctor-patient turn, reversed roles or gibberish, annotate uncertain so we can detect those faulty utterances.