So, good afternoon everyone. So, just to explain where, you know, the last 10 conferences
I have given a talk at, you know, none of them are, I know, of course, pharmacology.
Okay, I've been talking at tobacco conferences, I've been talking at, at, at, at, at, at
laboratory conferences and genetic conferences. So, so, I mean, it's just that, you know,
it is, when it's, uh, for to keep me relevant in the geriatric clinic and I, thank you very,
very much, Venita.
But, yeah, I'm hoping that I will be able to do a good job. Uh, you should, you should
me, you should be, you should be up the night.
Okay.
So, uh, yeah, I'll be talking to you about the optimal tools to judge the appropriate
techniques, the, the, the, the, the, the, the, the, the, the, the, the, the, the, the, the,
the, the, the, the, the, the, the, the, the, the, the, the, the, the, the, the, the, the,
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the, the, the, the, the, the, the, the, the, the, the, the, the, the, the, the, the, the,
off to the drugs. So, definitely, I mean, uh, the long and short is they behave
differently, you know, because of some physiological alterations. No. So, they
don't kind of, uh, react similarly to a drug as, uh, anger person would do. So, and, uh,
the other problem is with age, a lot of things get added. You know, there are a lot of comorbidities.
So, drugs will get added and there could be, uh, you know, interactions between drugs,
the recruitment traction between drugs and other diseases which you know that specific
drug may not be intended for.
So the result you know the whole scenario gets very very complicated.
So it becomes very important to understand what are potentially appropriate medications
and what could be potentially inappropriate.
So for the same reason you know medication management becomes even more important in the
other language sense you know medication management is important you know we need to know what
medication somebody is getting and you know reconciliation is important.
You know giving it, spreading a thought on whether you know that medicine is actually
absolutely essential or you know somebody can do away with the medication is extremely
important but it takes even more relevance in the context of an older cancer patient
because of their higher sensitivity to some of the side effects that we just discussed.
And of course you know there is whole lot of drugs going on in the context of cancer
trachear you know chemotherapy, immunotherapy and then they have they can have their own
specific impact on cancer patients and over and above that let's say if you have to use

some tricks for gas titers or if you want to use some tricks for constipation and you know urinary incontinence or whatever you know I mean it can complicate the whole situation.
So therefore I know this whole process of medication reconciliation and the effective communication with patients and the medication reminders will become very very important.
Okay so now how do we define potential inappropriate medications so medications must be so those medications which has to be avoided you know as the if there is a you know because of the high risk of adverse events in certain groups of patients or if there is very you know sparse evidence about the risk benefit ratio of using that medication in a particular group of patients.
So those are called as potentially inappropriate so either the harm the risk is not clearly defined the benefit is not clearly defined or there is very clear indication that you know it can be you know risky.
So the you know such medications will qualify as potentially inappropriate medications okay and they contribute to adverse reactions for reasons that we discussed in the past.
So now the next thing is what do we do you know how do we kind of reconcile you know the inappropriate of medications.
So there are several tools in existence and I think you know I don't have to kind of talk to this group about the tools but then this table actually gives an overview of what are the different tools and you know in which geographic area were those tools developed the era in which it was developed and you know how many drugs are actually included in the tools.
So that way if you look at it you know starting from BS criteria to 4-tar to priskers to use 7.
So typically they include about 250 to 300 drugs belonging to 37, 35 or 40 you know pharmacological groups.
I am sorry okay and these are the widely sorry widely used drugs to use the drugs.
So I decide you know whether a given medication is potentially appropriate or inappropriate.
The AGS, BS and Stoppensknot and priskers for age, U7 and so on.
But there are certain challenges of implementing these tools you know including clinical limitations.
So some of these tools are very very region specific as we all know like for example priskers is very specific for Germany and 4-tar is designed for you know keeping in mind specific population and then you know sometimes the tools are so elaborate that you know somebody has to be actually trained on them you know before they can kind of start evaluating medications for their appropriateness and some of these scales you know in the majority of these scales you know do not actually talk about anti-cancer drugs itself as to you know whether they are appropriate for a given age or not.

So those are some of the challenges that we face.
So in this context we thought you know we should kind of do a study to understand which
of these tools you know actually work best in our setting okay.
So it was titled performance of potentially inappropriate medications assessment tools
in older Indian patients with cancer.
So it was a very simple study that we did.
I mean there were 500 odd patients that were kind of screened and 467 were eligible because
the remaining 40 odd patients were not getting any medication at all I mean in the sense you
know so they had to be exploited because you know this exercise was to see you know whether
how to kind of identify potentially inappropriate medications.
So obviously we had to leave out patients who were not on any medications.
So 467 patients you know.
So at least you know in the one fourth of the patient you know the evidence in some of
the medicines were found to be in the appropriate for the patient and also the people of the
patient had at least one medication in the appropriate.
So basically you know because the population which had a large
number.
Can you hear me?
Yeah.
So a large prevalence of comorbidities so and which is very typical and representative
of the genetic population anywhere in the country.
So now what we did was we kind of okay so there is a little bit of math you know behind
it.
So but the long and short once again is that you know you have these five different scales
and then let us say you know B.S. criteria identify is 3 out of 10 medications.
So let us say patient is on 10 medications B.S. my 953 is inappropriate.
Stop and shut my 857 is inappropriate and you 7 identify 5 is inappropriate.
So taking these values we created what is called as a standardized PIM score or a standardized
PIM value which is just a number of medications which are recognized as inappropriate by a
given score versus the total number of medications.
So if it is 3 out of 10 the standardized PIM value would be 0.3.
If it is 5 out of 10 the standardized PIM value would be 0.5.
If it is 700 of 15 the standardized PIM value would be something like 0.47 or whatever.
So that is how we calculated the standardized PIM value for every scale and then we took
an average of all those you know for a given patient so and that act as a median.
So now you know see the reason why we had to average out all those 5 scales to calculate
the median is because we need a gold standard to compare which scale is performing better
and in the absence of an actual gold standard because you know even B.S. which is you know
commonly used back then you know was being evaluated here.
So what is the gold standard?
So we took the median and this is a perfectly you know legit approach because there is a

phenomena called regression to the mean in statistics okay.
So this is not exactly regression to the mean but if there are 4 or 5 different observations
on a parameter then the truth you know lies somewhere in the middle.
That is assumption and that is valid assumption so because of which we took the median and
that served as the gold standard and then we plotted this banded ultimate plots.
So banded ultimate plots basically tells you what is the agreement between U.S. core and
the gold standard okay.
And as you can see here the fifth one the U7 it performed best because it had the greatest
agreement.
So in the sense you know if you look at the width of the interval there it was minimum
so and most of the so basically if you look at the y axis now if there is no difference
between the median and your given score then if there is no difference then the value will
be 0.
So if all the values are 0 which means it is exactly concurring with the median and those
values should lie along the line 0 but if the scatter is very close to 0 then you know
it means that the scale is performing well.
So that way we established that the European U7 is performing best under the circumstances
and we also plotted what is called as heat map and the heat map is here is you know all
the standard spin values are reached in ascending order as far as the median is concerned and
you can see the darker the shade the less is the standard spin value and the more lighter
the shade the more of the peak value which means that you know they had more inappropriate
medications and as you can see that you know U7 if you look at the shades so U7 matches
very very closely with the median followed by BRS criteria followed by Priscus.
In fact you know the scales which are on the right are slightly over estimating the pims
which means that if the actual number of pims is about 5 out of 10 so this might say you
might say about 5.5 out of 10 okay but the ones on the left are slightly over estimating
like the actual is 5 BRS may say it is 6 I mean it is 6 or 7 so that is over estimating
the pim on the right hand side is underestimating if actually this file the U might say it is
3 or 4 or whatever okay but the thing is U came very very close to the median and based
on which we decided that you know perhaps that is the score that we should be kind of
which is most suitable you know in our condition and of course I mean that does not mean that
you know you should stop using BRS criteria if you are used to it because BRS has stood
the rest of time it is one of the most extensively validated tools in North America and of course
you know many clinics here use BRS criteria and it was a very close second I mean

it not
as though it performed very very poorly as compared to U7 if U7 was slightly you know
underestimating the pims BRS was slightly over estimating the pims but maybe it was slightly
more farther away from the truth as compared to U7 so based on that you know we concluded
that U7 is perhaps the way to go but you know BRS is not bad either so now I mean this table
in the next two tables I am going to summarize some of the advantages and disadvantages of
all the scales and all of us know that you know U7 was kind of developed specifically
for European countries and it may not address newer medications or region specific prescribing
patterns effectively so this is one of the limitations of that on the other hand BRS is
one of the most widely used and widely extensively validated tool but it lacks patient specific
customization especially in the context of comorbidities and individual tolerance and likewise
stop and start has some advantages like you know it considers coexisting diseases and
risks so therefore if you want to actually minimize adverse events you know historically
stop and start has been shown to do better than most scales but it is a very time intensive
scale you know because the number of questions that you have to kind of go through is very
very intensive and therefore you know it is not easy to execute.
Likewise, Pritzker provides alternatives to PIM which maybe it is USP and but it may not
be comprehensive for all direct classes because you know we looked at 35 or 37 all classes
for other drugs but Pritzker may not have that many and FOTA it highlights beneficial
treatment like for example FOTA is very clear so it says A, B, C it characterizes them so
A is very beneficial and E may be not you know very harmful so so that way it gives clear
classification so it is very black and white so therefore it can be sometimes very easy
to implement.
So then I know this is my last slide the SWOT analysis about these PIMs so the strengths
of course are that you know it will help you to standardize so if you are using any
of those tools in your clinic so it will help you to standardize practices it will help
you to identify the pressure you know potential in appropriate medications and then kind of
minimize the side effects caused due to the toxicities of these tricks but on the other
hand the weakness is that you know they are extremely resource intensive and because there
are so many tools sometimes you know standardization may become a bit of a problem and technology
is a barrier like for example you know just in the earlier session we discussed about
integrating A into all these things so once A that is a definite opportunity

because once
A can be integrated then you know we can actually start identifying which segment of you know
your patient pool is likely to have more potential in appropriate medications and then maybe
more focus can be you know put in those sections of your time tell which are likely to have you know potential in appropriate medications so that way you know integrating
artificial intelligence is going to be a great opportunity in this setting and but you know
for any new clinic which is kind of about to start you know genetic assessment and assessment
of inappropriate medications there is of course lot of resistance because we are all you you
know we all like inertia so we tend to kind of in the remaining state in the state of
rest or uniform motion so so the inertia is always an issue so this brings me to the end
of this talk so to sum it up I think you know EU7 performed quite well in our setting and
maybe you know although it was designed for European country it may be appropriate in
our setting as well but if you are using BS criteria I don't think you know you should
worry too much but of course you know each of the skills that we discussed here has the
rule of strength and weaknesses and you know you may have to kind of pick and choose depending
on your specific requirements so thank you very much.