

GBMC

Timely Treatment of Maternal Severe Hypertension:

Epic Hyperspace Dashboard Application

February 2022

GBMC Epic Hyperspace Dashboard

- Allows for close to real-time monitoring of rates
- Flexibility of date range selection and aggregation
- Drilldown capability to specific cases
- **Fully automated – no manual review necessary**

Severe Hypertensive Measures ▾
Sep 2021 - Feb 2022 ▾

Dashboard Links

Main OB Perinatal Dashboard

OB Hypertensive Emergency Orderset

Higher is better

	Sep 21	Oct 21	Nov 21	Dec 21	Jan	Feb	FYTD
Hypertensive Orderset Usage	49.44 %	45.57 %	43.55 %	51.33 %	46.97 %	53.13 %	43.88 %

Overall Compliance

Higher is better

62.50 % Persistent Hypertensive Overall Compliance Feb

	Sep 21	Oct 21	Nov 21	Dec 21	Jan	Feb	FYTD
Persistent Hypertensive Overall Compliance	60.56 %	60.76 %	67.74 %	47.22 %	62.12 %	62.50 %	58.18 %
Hispanic	66.67 %	33.33 %	100.00 %	0.00 %	66.67 %	0.00 %	57.14 %
White	51.43 %	63.89 %	57.14 %	51.61 %	58.33 %	60.00 %	58.06 %
Black	66.67 %	58.33 %	72.22 %	45.71 %	68.57 %	80.00 %	59.11 %
Native American Indian	-	-	-	-	-	-	-
Asian	100.00 %	0.00 %	75.00 %	33.33 %	0.00 %	66.67 %	42.86 %
All Other	100.00 %	100.00 %	-	50.00 %	100.00 %	33.33 %	64.71 %

Medication Compliance

Higher is better

22.49 % Persistent Hypertensive Medication 1 Hr Compliance FYTD

	Sep 21	Oct 21	Nov 21	Dec 21	Jan	Feb	FYTD
Persistent Hypertensive Medication 1 Hr Compliance	19.72 %	24.05 %	29.03 %	19.44 %	25.76 %	25.00 %	22.49 %
Hispanic	0.00 %	0.00 %	100.00 %	0.00 %	33.33 %	0.00 %	21.43 %
White	11.43 %	19.44 %	14.29 %	19.35 %	20.83 %	13.33 %	16.59 %
Black	33.33 %	30.56 %	33.33 %	17.14 %	28.57 %	50.00 %	27.51 %
Native American Indian	-	-	-	-	-	-	-
Asian	0.00 %	0.00 %	50.00 %	33.33 %	0.00 %	33.33 %	23.81 %
Other	0.00 %	33.33 %	-	50.00 %	100.00 %	0.00 %	17.65 %



Persistent Hypertensive Overall Compliance

Feb

Sep 21	Oct 21	Nov 21	Dec 21	Jan	Feb	FYTD
60.56 %	60.76 %	67.74 %	47.22 %	62.12 %	62.50 %	58.18 %
66.67 %	33.33 %	100.00 %	0.00 %			
51.43 %	63.89 %	57.14 %	51.61 %			
66.67 %	58.33 %	72.22 %	45.71 %			
-	-	-	-			
100.00 %	0.00 %	75.00 %	33.33 %			
100.00 %	100.00 %	-	50.00 %			

- View Week
- View Cases Details
- View Numerator Resolved
- View Numerator Not Resolved
- View Numerator Overall Compliant
- View Numerator Overall Not Compliant
- Filter Graph

Drilldown Options:

- Shows the cases based on their groups and from drilldown, can go straight to the patient's chart

Radarc Metric Details

Persistent Hypertensive Overall Compliance - Numerator Not Resolved

[Return To Dashboard](#)

[Open Chart](#)

Loading Data...

Name	Patient CSN	Admission Date	Discharge Date	Orderset Flag	Med Taken Time	BP Time	GC Patient Race	MedicationTAT	Initial Time Zero	MedCompliant	Numerator Resolved	BP Readings	TimeType	TAT To Next Reading	Hour Cut Off	TimesInThatHou
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SQL Manual Metrics: A SQL query that incorporates all the parameters.

Development Steps:

1. Created various temp tables/CTEs to pull relevant data points from the MAR, and nursing flowsheets for the BP readings.
2. Identify an initial population
3. Apply exclusion parameters to arrive at clean denominator base.
4. Identify various ways that a case is “resolved” based on BP readings only.

```
SQL Query:
IDJ_SevereHyperte...(GBMC\MNoel (78))
from #resolvepre
where Timetype = 'Normal'
group by csn)

select m1 -
into #additionalexclusions
from main m1
inner join main2 m2 on m2.csn = m1.csn --- making sure there is at least one normal in the occurrence
where m1.CountDs=1 and TotalSTNTime=16
/* additional cases that need to be removed from denominator */

/* final squeaky clean data set */
if object_id('tempdb..#resolve') is not null drop table #resolve
select r *
into #resolve
from #resolvepre r
left join #additionalexclusions ae on ae.csn = r.csn
where ae.csn is null

if object_id('tempdb..#mnfinal') is not null drop table #mnfinal
select distinct csn, InitialTimeZero, Denominator, Numerator_Resolved
into #mnfinal
from #resolve
```

DISP_NAME	RECORDED_TIME	InitialTimeZero	MEAS_VALUE	Timetype	TATToNextTime	NextTimeType	IncludeFlagCode	Denominator	TotalRunningTime	HourCutOff	TimesInThatHour	Resolved1	Resolved2	Nur
BP	2020-06-28 12:35:00.000	2020-06-28 12:07:00.000	204/95	STN	5	STN	1	1	33	2020-06-28 13:07:00.000	2020-06-28 12:35:00.000	NULL	1	1
BP	2020-06-28 12:30:00.000	2020-06-28 12:07:00.000	185/92	STN	5	STN	1	1	28	2020-06-28 13:07:00.000	2020-06-28 12:30:00.000	NULL	1	1
BP	2020-06-28 12:25:00.000	2020-06-28 12:07:00.000	190/91	STN	5	STN	1	1	23	2020-06-28 13:07:00.000	2020-06-28 12:25:00.000	NULL	1	1
BP	2020-06-28 12:20:00.000	2020-06-28 12:07:00.000	190/96	STN	5	STN	1	1	18	2020-06-28 13:07:00.000	2020-06-28 12:20:00.000	NULL	1	1
BP	2020-06-28 12:14:00.000	2020-06-28 12:07:00.000	190/101	STN	6	STN	1	1	13	2020-06-28 13:07:00.000	2020-06-28 12:14:00.000	NULL	1	1
BP	2020-06-28 12:12:00.000	2020-06-28 12:07:00.000	227/129	STN	2	STN	1	1	7	2020-06-28 13:07:00.000	2020-06-28 12:12:00.000	NULL	1	1
BP	2020-06-28 12:07:00.000	2020-06-28 12:07:00.000	204/119	STN	5	STN	1	1	5	2020-06-28 13:07:00.000	2020-06-28 12:07:00.000	NULL	1	1
BP	2020-06-28 22:00:00.000	2020-06-28 12:07:00.000	178/83	STN	13	Normal	0	1	13	2020-06-28 13:07:00.000	NULL	NULL	1	1
BP	2020-06-28 22:13:00.000	2020-06-28 12:07:00.000	126/76	Normal	47	Normal	NULL	1	60	2020-06-28 13:07:00.000	NULL	NULL	NULL	1
BP	2020-06-28 23:00:00.000	2020-06-28 12:07:00.000	115/78	Normal	NULL	NULL	NULL	1	60	2020-06-28 13:07:00.000	NULL	NULL	NULL	1

5. Apply the medication administration within 60 minutes of onset as secondary option for compliance.
6. Create clean numerator and calculate rates

Additional Considerations:

- 1. It is a very iterative process – needs investment of time from both programmer and a clinical staff for data validation.**
- 2. Very little need (if none at all) to consult the chart. The validation Excel files used by clinical staff contains all the data points considered for the resolution or compliance.**
- 3. There is a SQL query ready for sharing particularly for Epic hospitals, but will probably require additional validation depending on specific workflows.**

EXAMPLE CASES:

A. Exclusions – patients that never had any qualifying “occurrences”

These are all the patients that were similar to Patient A - only one reading in the entire stay with 160+ or 110+
 All the rest of the readings are normal
 The very next reading after time zero is 15 minutes or less

csn	disp_name	recorded_time	InitialTimeZero	meas_value	timetype	TATToNextTime	NextTimeType	IncludeFlagCode	Denominator
	BP	10/10/21 0:36	10/10/21 0:36	163/94	STN		12 Normal	0	0
	BP	10/10/21 0:48	10/10/21 0:36	155/90	Normal		15 Normal		0
	BP	10/10/21 1:03	10/10/21 0:36	155/93	Normal		15 STN		0
	BP	10/10/21 1:18	10/10/21 0:36	160/95	STN		15 Normal	0	0
	BP	10/10/21 1:33	10/10/21 0:36	159/102	Normal		15 Normal		0
	BP	10/10/21 1:48	10/10/21 0:36	157/102	Normal				0
								0	0
	BP	10/13/21 15:11	10/13/21 15:11	172/72	STN		15 Normal	0	0
	BP	10/13/21 15:26	10/13/21 15:11	156/74	Normal		84 Normal		0
	BP	10/13/21 16:50	10/13/21 15:11	148/95	Normal				0
								0	0
	BP	10/9/21 19:00	10/9/21 19:00	168/87	STN		12 Normal	0	0
	BP	10/9/21 19:12	10/9/21 19:00	145/84	Normal		4 Normal		0
	BP	10/9/21 19:16	10/9/21 19:00	148/76	Normal				0
								0	0
	BP	10/10/21 3:09	10/10/21 3:09	162/79	STN		4 Normal	0	0
	BP	10/10/21 3:13	10/10/21 3:09	145/83	Normal		5 Normal		0
	BP	10/10/21 3:18	10/10/21 3:09	134/82	Normal		373 STN		0
	BP	10/10/21 9:31	10/10/21 3:09	186/74	STN		14 Normal	0	0
	BP	10/10/21 9:45	10/10/21 3:09	139/63	Normal		75 Normal		0
	BP	10/10/21 11:00	10/10/21 3:09	132/86	Normal				0
								0	0
	BP	11/21/21 13:03	11/21/21 13:03	164/96	STN		9 Normal	0	0
	BP	11/21/21 13:12	11/21/21 13:03	154/88	Normal		10 Normal		0
	BP	11/21/21 13:22	11/21/21 13:03	158/87	Normal		10 STN		0

RECORDED_TIME	InitialTimeZero	MEAS_VALUE	Timetype	TATToNextTime	NextTimeType	IncludeFlagCode	Denominator	TotalRunningTime	HourCutOff	TimesInThatHour
9/27/21 20:34	9/27/21 20:34	171/85	STN		1 STN	1	1	1	9/27/21 21:34	9/27/21 20:34
9/27/21 20:35	9/27/21 20:34	171/85	STN		6 Normal	0	1	7	9/27/21 21:34	9/27/21 20:35
9/27/21 20:41	9/27/21 20:34	130/81	Normal		3 Normal		1	10	9/27/21 21:34	9/27/21 20:41
9/27/21 20:44	9/27/21 20:34	109/67	Normal				1	10	9/27/21 21:34	9/27/21 20:44

EXAMPLE CASES:

B. Identifying the initial time zero and a “revised” time zero – The original onset was 10/13 22:11 but it only took 8 minutes for the next normal, so this “set” of occurrence does not count and the logic looks for the next set of occurrences. Next STN is followed by a normal - after 15 minutes, but before the hour is over from that “revised” time-zero, 2 normal were recorded so this was “resolved”. Logic stops after the first qualifying occurrence.

B	C	D	E	F	G	H	I	J	K	L	M	P	Q	R
DISP_NAME	RECORDED_TIME	InitialTimeZero	MEAS_VALUE	Timetype	TATToNextTime	NextTimeType	IncludeFlagCode	Denominator	TotalRunningTime	HourCutOff	TimesInThatHour	Numerator_Resolved	Version 6	Changed from Version 6?
BP	10/13/21 22:11	10/13/21 22:11	163/99	STN	8	Normal	0	1	8	10/13/21 23:29		1	1	
BP	10/13/21 22:19	10/13/21 22:11	156/98	Normal	10	STN		1	18	10/13/21 23:29		1	1	
BP	10/13/21 22:29	10/13/21 22:11	172/101	STN	16	Normal	1	1	16	10/13/21 23:29	10/13/21 22:29	1	1	
BP	10/13/21 22:45	10/13/21 22:11	153/101	Normal	3	Normal		1	19	10/13/21 23:29	10/13/21 22:45	1	1	
BP	10/13/21 22:48	10/13/21 22:11	156/87	Normal	51	STN		1	70	10/13/21 23:29	10/13/21 22:48	1	1	
BP	10/13/21 23:39	10/13/21 22:11	164/88	STN	9	STN	1	1	9	10/13/21 23:29		1	1	
BP	10/13/21 23:48	10/13/21 22:11	160/88	STN	12	STN	1	1	21	10/13/21 23:29		1	1	
BP	10/14/21 0:00	10/13/21 22:11	170/95	STN	9	STN	1	1	30	10/13/21 23:29		1	1	
BP	10/14/21 0:09	10/13/21 22:11	178/97	STN	17	STN	1	1	47	10/13/21 23:29		1	1	
BP	10/14/21 0:26	10/13/21 22:11	161/90	STN	25	Normal	1	1	72	10/13/21 23:29		1	1	
BP	10/14/21 0:51	10/13/21 22:11	144/94	Normal	16	Normal		1	88	10/13/21 23:29		1	1	
BP	10/14/21 1:07	10/13/21 22:11	150/86	Normal	1823	STN		1	1911	10/13/21 23:29		1	1	
BP	10/15/21 7:30	10/13/21 22:11	160/95	STN	15	Normal	0	1	15	10/13/21 23:29		1	1	
BP	10/15/21 7:45	10/13/21 22:11	159/98	Normal	15	STN		1	30	10/13/21 23:29		1	1	
BP	10/15/21 8:00	10/13/21 22:11	185/100	STN	30	STN	1	1	30	10/13/21 23:29		1	1	
BP	10/15/21 8:30	10/13/21 22:11	169/97	STN	30	Normal	1	1	60	10/13/21 23:29		1	1	
BP	10/15/21 9:00	10/13/21 22:11	131/75	Normal	30	Normal		1	90	10/13/21 23:29		1	1	
BP	10/15/21 9:30	10/13/21 22:11	139/80	Normal	30	STN		1	120	10/13/21 23:29		1	1	
BP	10/15/21 10:00	10/13/21 22:11	166/100	STN	10	STN	1	1	10	10/13/21 23:29		1	1	
BP	10/15/21 10:10	10/13/21 22:11	180/103	STN	15	STN	1	1	25	10/13/21 23:29		1	1	
BP	10/15/21 10:25	10/13/21 22:11	165/99	STN	79	Normal	1	1	104	10/13/21 23:29		1	1	
BP	10/15/21 11:44	10/13/21 22:11	142/88	Normal	1	Normal		1	105	10/13/21 23:29		1	1	
BP	10/15/21 11:45	10/13/21 22:11	142/88	Normal				1	105	10/13/21 23:29		1	1	

EXAMPLE CASES

C. Final Compliance – the final clean, distinct encounter only worksheet can pull “compliance” from 2 sources, either from the resolution on the flowsheet readings or the administration of the medications based on original onset.

HOSP_ADMSN_TIME	HOSP_DISCH_TIME	ReportDate	InitialTimeZero	Denominator	Numerator_Resolved	TAKEN_TIME	MedTA	MedCompliant	NumeratorFinal
11/3/21 16:20	11/13/21 11:43	11/3/2021	11/3/21 16:36	1		11/3/21 17:27	51	1	1
10/13/21 11:09	10/15/21 19:20	10/13/2021	10/13/21 12:37	1	1				1

**THE
END**