



Med Conformity



and the importance of adherence with as needed medications, especially in the treatment of pain.

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BHI 505: Digital Health



Opioid: Brief history

- › 1991: 76 million Rxs for opioids
- › 2011: 219 million Rxs for opioids
 - As expected, overdoses and hospitalizations also increased in stride.

Jamison, RN; Martel, MO; Huang, C; Jurcik, D; Edwards, RR. (2016). Efficacy of the Opioid Compliance Checklist to Monitor Chronic Pain Patients Receiving Opioid Therapy in Primary Care. *The Journal of Pain*. 17(4): 414-423. Doi: <http://dx.doi.org/10.1016/j.pain.2015.12.004>

Table The 8-Item Opioid Compliance Checklist Test

Over the past month, have you:

- 1** Taken your opioid medication other than the way it was prescribed?
- 2 Used more than one pharmacy to fill your opioid prescriptions?
- 3 Received opioid prescriptions from more than one provider?
- 4 Lost or misplaced your opioid medications?
- 5** Run out of your pain medication early?
- 6** Missed any scheduled medical appointments?
- 7 Borrowed opioid medication from others?
- 8 Used any illegal or unauthorized substances?

Source: Adapted from: Jamison R, et al. *J Pain*. 2016;17:414-423.

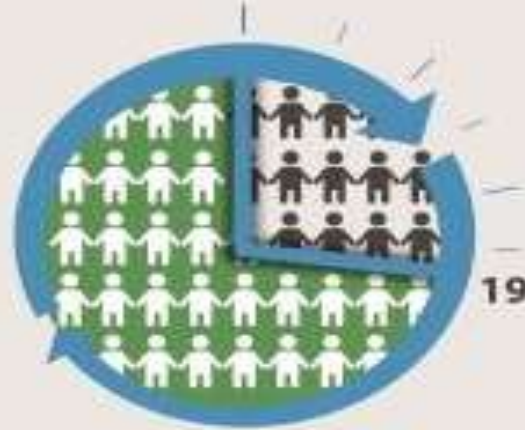


Is this an American problem?

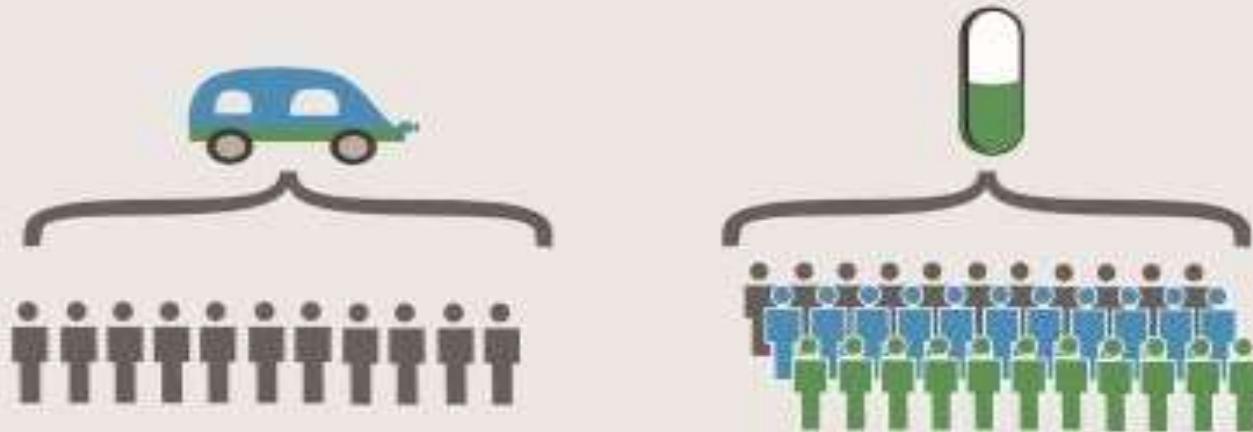
- › <https://www.cnbc.com/2016/04/27/americans-consume-almost-all-of-the-global-opioid-supply.html>
- › Approximately 80% of the global opioid supply is consumed in the United States
 - US represents 5% of world's population.
- › “The 300 million pain prescriptions equal a \$24 billion market”
- › “If you include Canada and Western Europe, [consumption of global opioid supply] increases to 95 percent, so the remaining countries only have access to about 5 percent of the opioid supply," said Vikesh Singh”

Why opioid medications? (Part 1)

**Every 19 minutes
someone dies from
the misuse of opioids.**



**Every year more people die from opioid
overdose than in car accidents.**



Source: <https://paindoctor.com/opioid-therapy-12-step-checklist/>

Why opioid medications? (Part 2)



Opioids:

The Startling Statistics:

- Every 19 minutes someone dies from the misuse of prescription drugs
- Every year more people die from drug overdose than in car accidents

FACT!

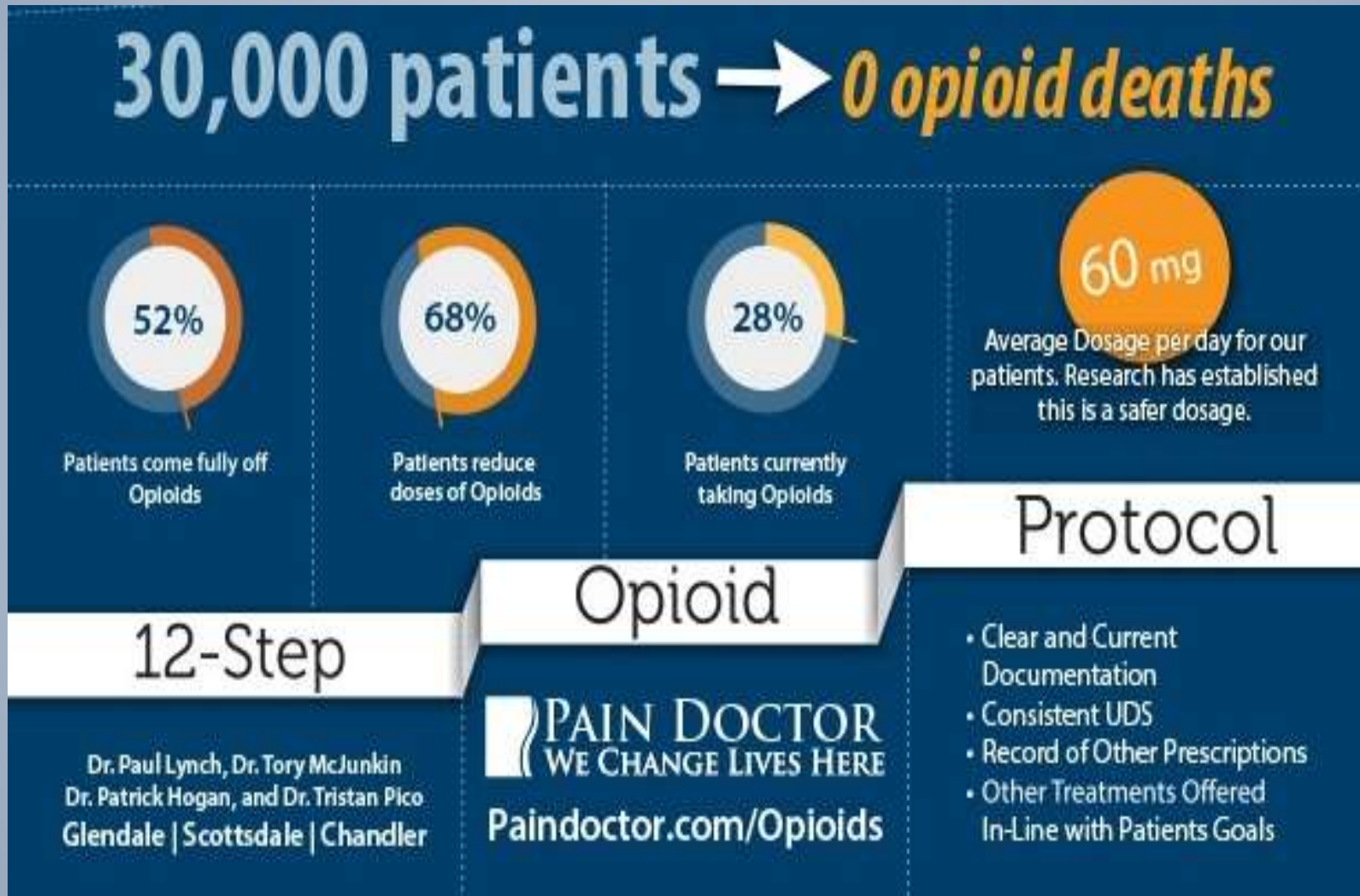
30% PATIENTS RECEIVE AN AVERAGE OF 30% PAIN RELIEF FROM OPIOIDS

Half of all Americans are on prescription drugs; of these the average is 5 different prescriptions per person.

WHAT ARE WE DOING ABOUT IT?

Source: <https://paindoctor.com/opioid-therapy-12-step-checklist/>

Why opioid medications? (Part 3)



Source: <https://paindoctor.com/opioid-therapy-12-step-checklist/>



Why opioid medications? (Finale)

› For opioid use, patients must have:

- Assessment of pain (0-10 scale)
- Current and updated medication list
- Review and documentation of patient's social history, including substance abuse history
- Review of recent Prescription Drug Monitoring report
- Physical examination of painful areas
- Discussion and documentation of risks and benefits of opioid therapy
- Established goals of opioid treatment and reviewed goals (e.g., patient wants to have an increased ability to function)
- Clear documentation of rationale for opioid use (e.g., chronic lower back pain or degenerative disc disease)
- Clear documentation of beneficial clinical response to opioid use (e.g., decrease pain or increase function)
- Current and consistent urine drug test based upon patient risk stratification
- Prescribe Naloxone (rescue medication for opioid overdose) to all patients who receive a script for an opioid
- Patient has signed a Controlled Substance Agreement within last six (6) months

Yup, 12 steps! End of free advertising for

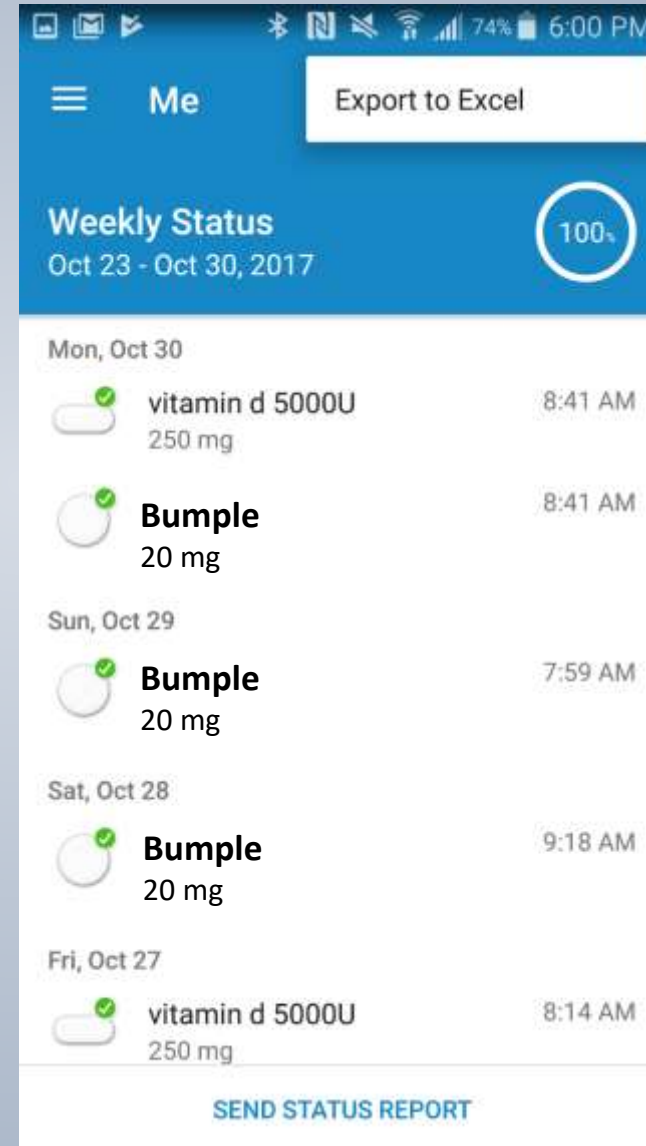
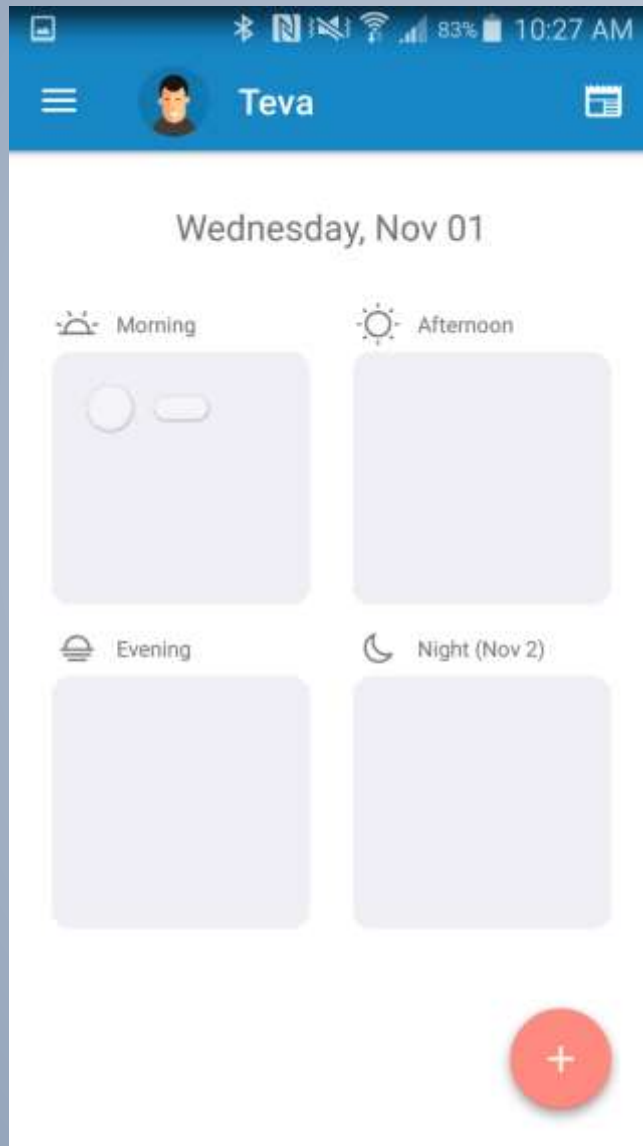
Source: <https://paindoctor.com/opioid-therapy-12-step-checklist/>



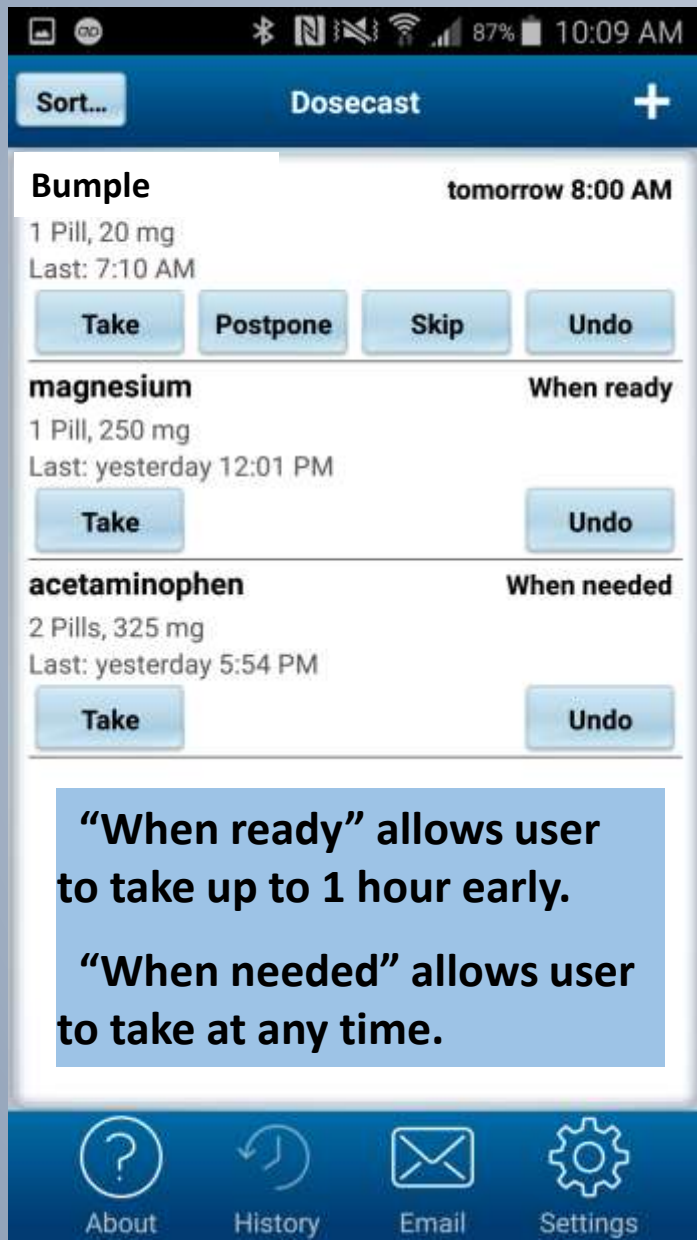
A Tale of Three Apps

- › Medisafe
 - Popular and robust app for chronic medication usage
- › Dosecast
 - Not as nice as Medisafe, but some “as needed” functionality
- › Memo Health
 - Sensors!
 - Kickstarter, technology centric, Android miss (mostly)

Medisafe and chronic medication adherence



Dosecast

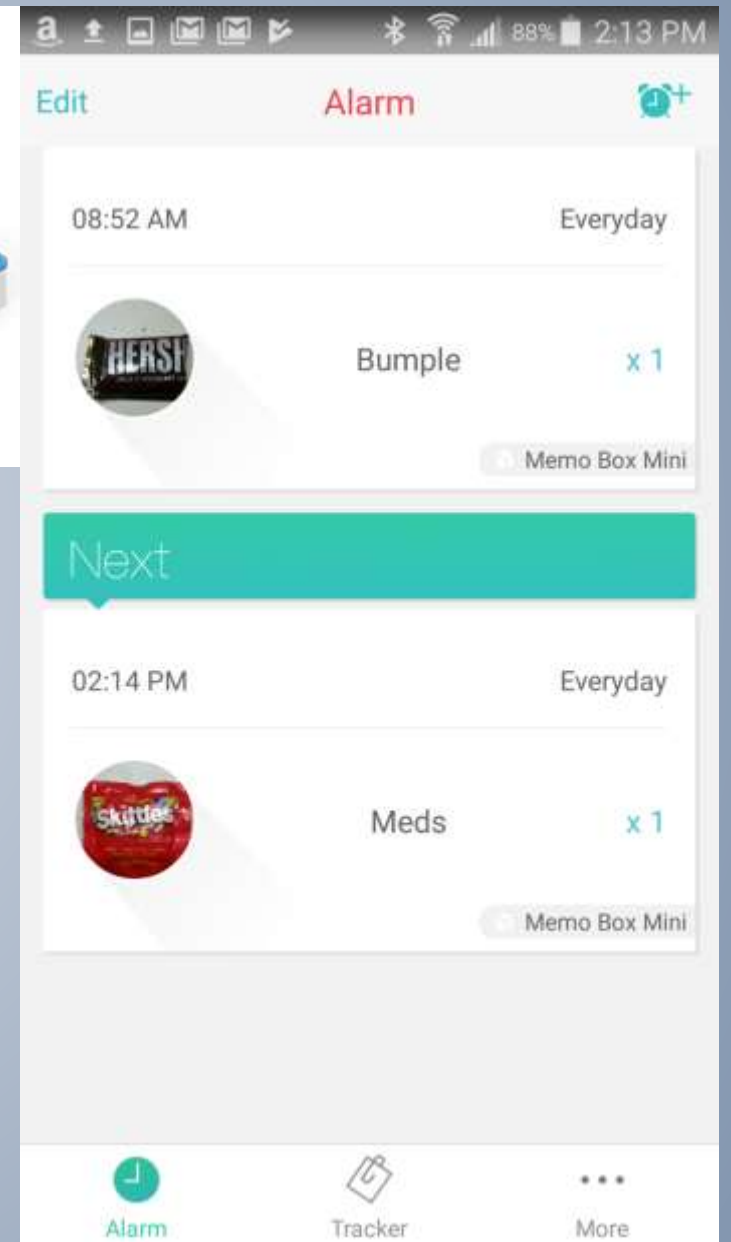
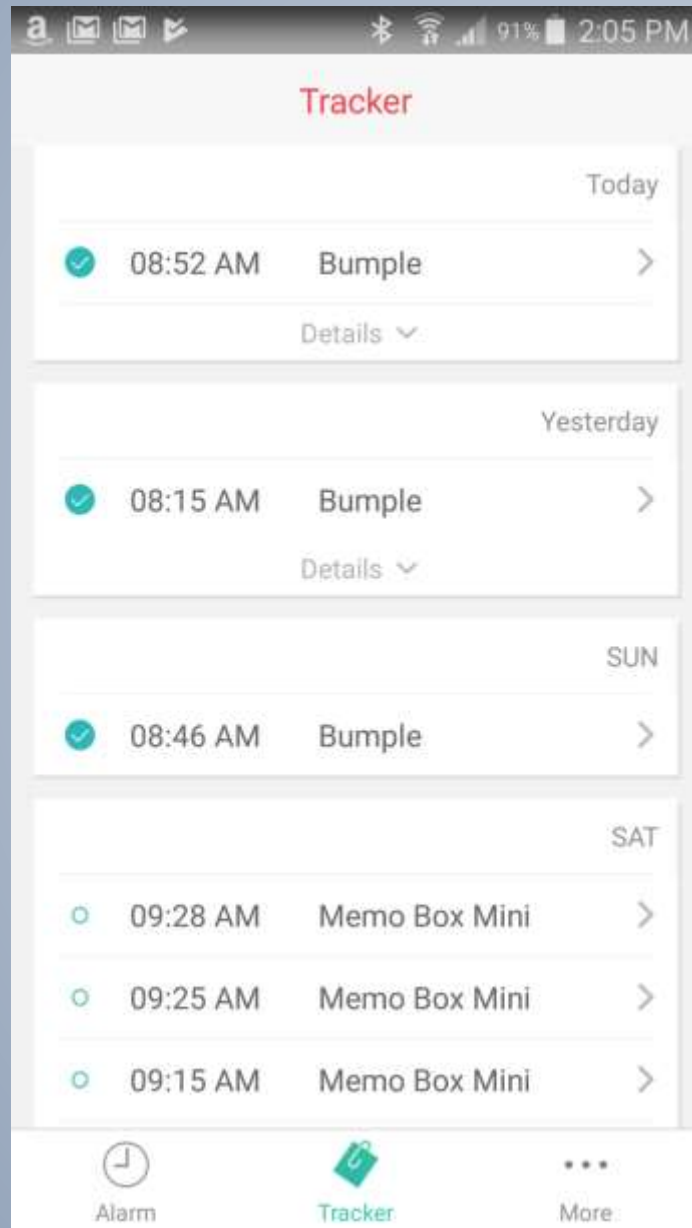


“When ready” allows user to take up to 1 hour early.

“When needed” allows user to take at any time.



Dosecast and Memo Box



The Verdict

Function or Characteristic	<i>Medisafe</i>	<i>Dosecast</i>	<i>Memo Health</i>	Comment
Free Option	Y	Y	Y	
Google Play rating	4.6	4.3	3.2	
Number of downloads	Millions	> 100K	> 500	
Price for premium	\$2.99/ month	\$2.99/ month	N/A	Or: Medi:\$23.99/year; Dose:\$27.99/year
Ease of download/install	5	5	5	
Ease of setup	5	3	3	Dose: Setup is confusing due to premium options being visible.
User-friendly	5	4	3	
Usability for intended user	5	3	3	Dose: Again, extra options can be confusing.
Ease of navigation	5	4	3	
Visual Clarity	5	4	4	
Configurability	5	4	3	
Usefulness of interface	5	4	4	
Supports Medication Compliance	5	4	5	
Encourages Compliance	5	4	4	
Tracks "As Needed" medication use	N	Y	N	Medi & Memo could 'skip' scheduled doses, but not the same as "as needed."





Tracking “As Needed” in Asthma: historical perspective

- › Mawhinney: “Using an as needed medication requires a different and more complex decision-making process than using regularly scheduled medications.”
 - Arbitrary users of medication may not be as good at “Specific Internal Awareness.”
- › “The high incidence of overuse is a particular concern in light that asthma deaths occur more frequently in patients using large doses of an inhaled bronchodilator”

Mawhinney, H; Specter, SL; Heitjan, D; Kinsman, RA; Dirks, JF; Pines, I. (1993). As-Needed Medication Use in Asthma Usage Patterns and Patient Characteristics. *Journal of Asthma*. 30(1): 61-71.

More from Asthma plus Digital Health

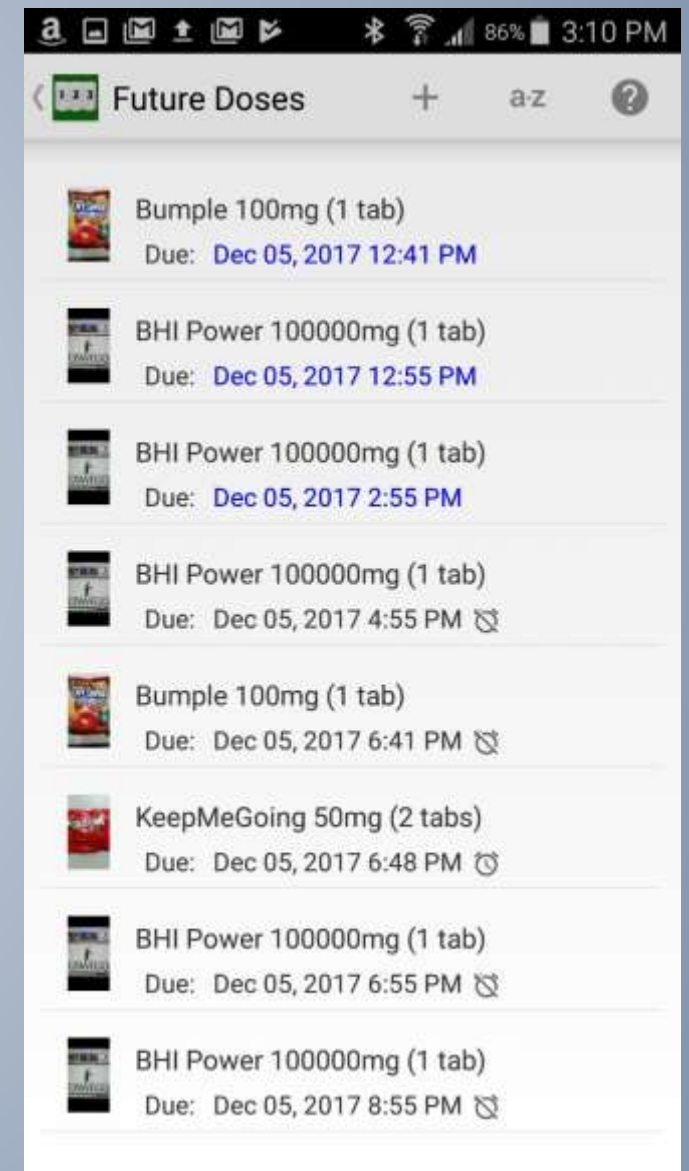
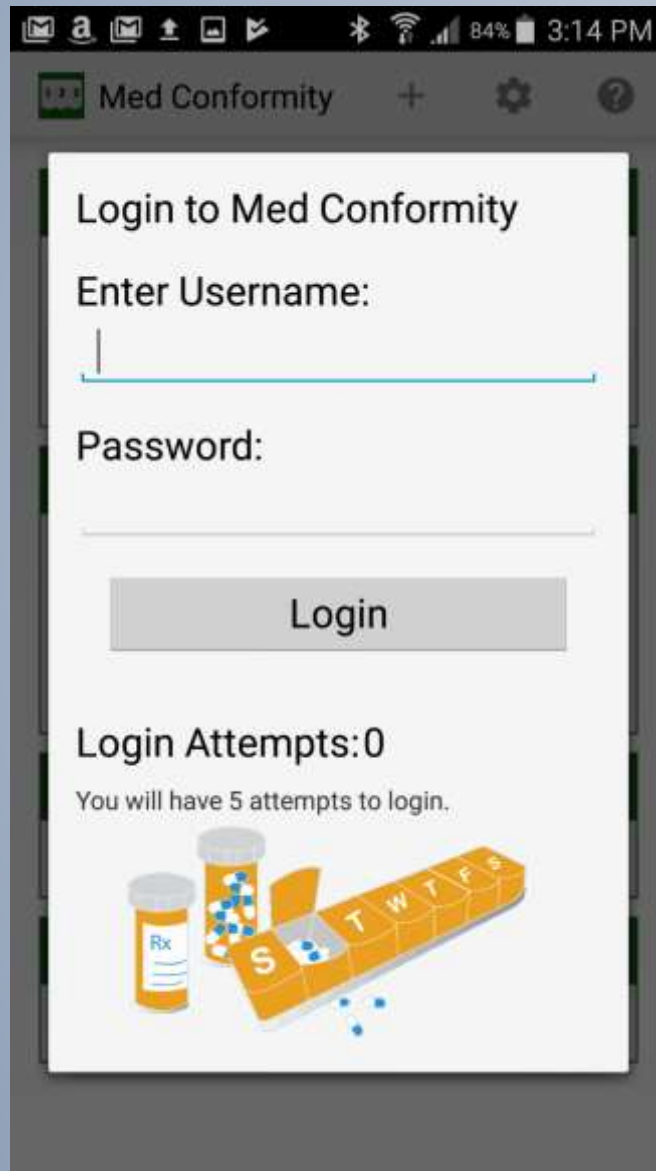
RESULTS

- 89 intervention group participants completed the survey; average age of respondents was 46 and median age was 49
- Participants used a mix of devices to transmit data (23% Android, 27% iPhone, and 50% hub)
- 99% of the respondents reported satisfaction with the inhaler device (79% very satisfied, 20% somewhat satisfied) (Figure 2, Table 1)
- 93% of the respondents reported satisfaction with the reports and the information they received (60% very satisfied, 33% somewhat satisfied) (Figure 3, Table 2)
- 90% of the respondents reported that the reports were useful for learning more about their asthma (45% very useful, 45% somewhat useful) (Figure 4, Table 2)
- 60% of respondents identified 1-7 new triggers as a result of participating in the study. Weather, allergy related and exercise were the most commonly identified triggers, documented across 79% of respondents who identified new triggers
- 72% of the respondents reported being interested in continuing to use the digital health tool beyond the study

Merchant, R., Inamdar, R., Henderson, K., Barrett, M., Sickel, D. V., & Hale, T. (2016). Patient Reported Value and Usability of a Digital Health Intervention for Asthma. *Journal Of Medical Internet Research*, 18(12), 1. doi:10.2196/iproc.6242

Med Conformity

(Take your Bumble?)





What I did to “DrugBug” for Med Conformity

› DrugBug from Github.com

- Added a login screen (easier said than done re: Activity v. Fragment!)
- Altered from chronic med reminders to as needed med available dosing.
 - › Less emphasis on “Reminders”
 - › Emphasis on “Doses due today” with a change in math algorithm.
 - › Red “late” doses changed to “blue” doses that are due.
 - › Added a “dose too early” warning.
 - › Added “Any Dose Due Now” to home screen.
- Resorted home and changed “Future Doses” to “Doses To Be Taken”
- Resorted dose history to default to newest to oldest dose.
- Added a ‘+’ Add drug to top menu of medication screen.
- Changed underlying database, then changed it back 😊



Just add sensors, and...



edible[®]
arrangements

- › Memo Box and other dose taking technologies
 - Or NFC tag on a medicine bottle? (Better late than never?)
- › Ingestible sensors



› **And, involve the professional and social support necessary for success.**