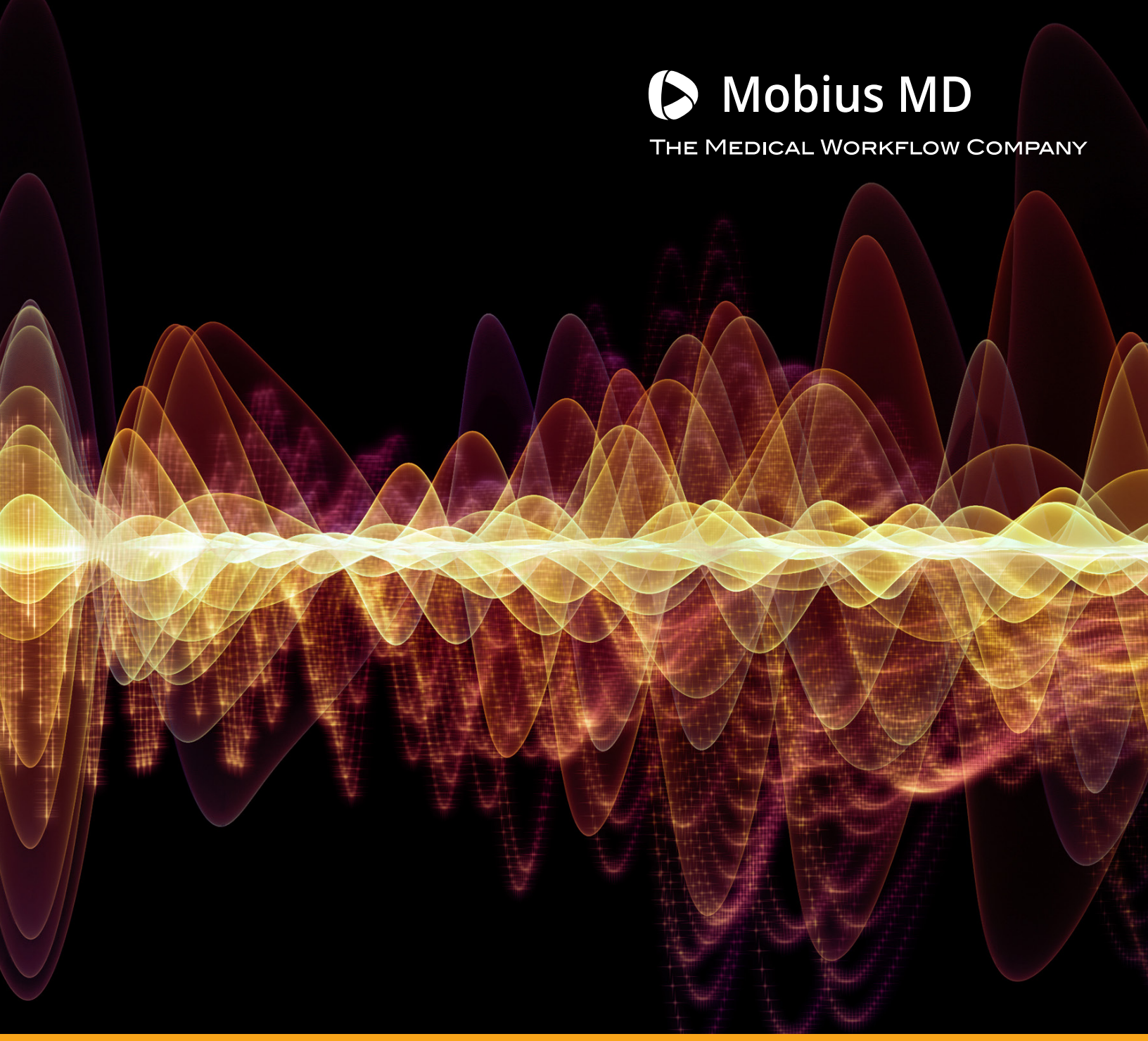
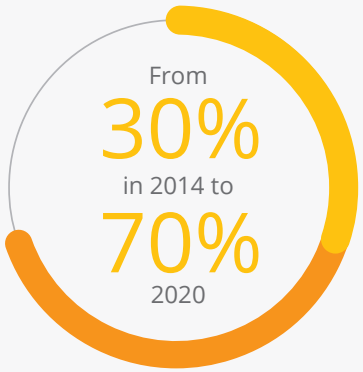


The Return On Investment Of Medical Dictation

Using Speech Recognition Technology

Introduction



IN 2020, THE AVERAGE DOCTOR SPENT **OVER 15 HOURS** ON DOCUMENTATION AND OTHER PAPERWORK EACH WEEK.

When physicians are asked which facet of their job could be completed more efficiently, most say "Documentation."[1] Still, physicians are spending an ever-increasing amount of their time on clinical documentation and administrative paperwork.

In 2014, fewer than 30% of physicians spent more than 10 hours per week on documentation and paperwork. By 2018, that number had risen to 70%. In 2020, the average physician spent over 15 hours on documentation and other paperwork each week.[2]

Given this growing mismatch between doctors' workflow realities and clinical priorities, it's no surprise that many physicians are feeling less satisfied with their work. According to one 2018 survey, a record 78% of physicians report experiencing burnout in their medical practice.[3]

While many factors contribute to burnout, most physicians believe EHRs make it worse.[4] In the digital era, health systems and clinicians need a more efficient way to document clinical notes while maintaining a high level of detail and accuracy.

1 Deloitte Survey of US Physicians (2018)

2 Medscape Physician Compensation Report (2020)

3 The Physicians Foundation (2018)

4 Eysenbach (2020) "The Influence of Electronic Health Record Use on Physician Burnout: Cross-Sectional Survey"

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Medical speech-to-text dictation has emerged as a popular alternative to typing clinical notes or dictating using a transcription service. Speech-to-text technology has improved significantly in the past decade, giving rise to a wide variety of software applications that allow physicians to speak into their computer or smartphone and have their words instantly appear in the EHR. These medical speech-to-text apps offer healthcare providers an efficient and convenient way to dictate directly into the EHR.

This whitepaper summarizes published research to estimate the return on investment (ROI) of adopting a medical speech-to-text software as part of a clinical documentation workflow. We estimate time and cost savings using speech-to-text for a typical primary care physician and discuss harder-to-measure returns including provider satisfaction.

MEDICAL SPEECH-TO-TEXT HAS EMERGED AS A POPULAR ALTERNATIVE TO TYPING CLINICAL NOTES

About Mobius MD: *Mobius MD is the medical workflow company and creator of Mobius Conveyor, the leading mobile dictation solution and the only medical speech-to-text software for doctors who use Macs. This white paper was written by the Mobius team based on published research, and it intends to provide an ROI estimate for using medical speech-to-text services.*

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Speech-To-Text vs. Medical Transcription

Medical speech-to-text, which is sometimes called "speech recognition" or "automated dictation" is the current state-of-the-art technology for converting spoken words into digital text. While commercial speech-to-text technology has existed since the 1990s, its accuracy has improved dramatically in recent years. These improvements have encouraged many physicians and hospitals to switch from medical transcription services to software that automates this process.

Despite the ubiquity of medical speech-to-text, providers can choose between a variety of medical dictation workflows. The following table compares dictation workflows and the benefits, costs, and well-suited applications for each option.[5]

5 Mobius MD (2019) "Which medical dictation workflow is best for you?"

DICTATION WORKFLOW	BENEFITS	COSTS	WHO SHOULD USE IT
Medical Transcription: digital voice recording is transmitted to an off-site transcription service to generate the documentation.	No extra steps required for the HCP; no need to learn new software or workflows.	Requires extra staff hours and/or paying for an off-site transcription service; final note may not be complete for several hours or up to several days; requires physician to return to the note for final review.	Physicians who do not wish to adopt a new workflow and have financial resources available for transcription services or additional staff.
Basic Medical Speech-to-Text: software transcribes spoken words into text within EHR fields and HCP edits for accuracy.	Transcription is instant and the physician can review and close the chart immediately; extremely accurate; lowest cost option; no need for additional staff or third-party transcription service.	While significantly faster than typing, still requires review and editing by physician; must purchase a subscription to medical speech-to-text software.	Physicians who are cost-efficient and do not mind learning a new, streamlined workflow in exchange for instant, accurate notes that arrive directly into the EHR with no additional typing.
Enhanced Mobile Speech-to-Text: smartphone- or tablet-based medical speech-to-text (see above) with additional note taking functionality for easy use on any computer or in transit.	Transcription is instant, accurate, and affordable; dictation can be completed anywhere and typed on any computer; allows flexibility and creative solutions for reducing documentation time and improving patient engagement.	Requires accuracy review by physician; requires comfort with mobile device technology like smartphones; requires a marginally more expensive, mobile-ready, speech-to-text software.	Physicians who are comfortable with technology and willing to explore the cutting edge of dictation workflows in exchange for substantial time and cost savings and new opportunities for patient engagement.

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Time Savings of Speech-To-Text

Physicians typically complete a patient's health record using a combination of typing, templates, and clicking options and dropdown menus. However, only about 20% of information in the EHR are structured clinical data.[6] The remainder of the clinical note is the written narrative that often drives revenue-related operations and demonstrates quality of care.

Medical dictation has long been a time-saving alternative to writing or typing the 80% of EHR data that makes up the clinical note. But traditionally, medical dictation required a professional transcriptionist, which added substantial cost and delays in completing patient charts. With improvements in speech-to-text technology, software can now instantly automate medical dictation.

But exactly how much time do physicians save by swapping typing for speech-to-text dictation when producing clinical notes?

The variety of individual and speciality-specific documentation workflows makes a definitive answer difficult to obtain. However, peer-reviewed research exists that compares typing to speech-to-text in a variety of contexts, which provides a starting point for valuable estimates. Because speech-to-text technology has changed dramatically in the last 10 years, we reviewed research since 2015 that specifically compares the speed of typing vs. dictation using speech-to-text software.

Three studies that quantify speed increases (equivalent to documentation time reductions) while using medical speech-to-text software instead of typing report increases of 26%, 64%, and 17%, respectively. While studies varied in design and sample size, all involved practicing clinicians generating clinical notes. In two instances, data were gathered using actual clinical notes following patient encounters, while in the remaining study, physicians were studied while generating clinical notes for simulated scenarios. An average of these findings estimates that medical speech-to-text software can reduce documentation time for most physicians by roughly 36%.

6 Optum360 (2019) "Natural language processing: A catalyst driving revenue cycle transformation"

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Documentation Time Using Medical Speech-To-Text vs. Standard Documentation

Study Description	Conclusion	Speed increase with medical speech-to-text
Comparison of 1455 clinical reports created by 28 physicians (pediatricians and trauma surgeons), randomized to compare with and without automatic speech recognition (ASR).[7]	"Medical documentation with the assistance of Web-based speech recognition leads to an increase in documentation speed, document length, and participant mood when compared to self-typing."	**26%** (Average documentation speed with automatic speech recognition was 173 characters per minute, compared to 217 without ASR.)
Comparing total documentation time required for 131 clinical notes created by 31 clinicians (cardiologists, neurologists, and nephrologists) using 4 combinations of natural language processing (NLP) entry and standard documentation.[8]	"This novel dictation-based approach has the potential to reduce the time required for documentation and improve usability while maintaining documentation quality."	**64%** (Standard data entry took on average 19.6 minutes compared to just 7 minutes using the NLP model.)
Controlled observational study measuring time required for 10 physicians to document clinical notes using typing vs. speech recognition (SR) in simulated outpatient scenarios.[9]	"Participants felt that SR saves them time, increases their efficiency and allows them to quickly document more relevant details."	**17%** (The same note dictated took on average 4'23" compared to 5'18" when typed.)
Average speed increase using medical speech-to-text compared to typing		**36%**

7 Vogel et al. (2015) "Analysis of Documentation Speed Using Web-Based Medical Speech Recognition Technology: Randomized Controlled Trial"

8 Kaufman et al. (2016) "Natural Language Processing–Enabled and Conventional Data Capture Methods for Input to Electronic Health Records: A Comparative Usability Study"

9 Blackley et al (2020) "Physician use of speech recognition versus typing in clinical documentation: A controlled observational study"

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Importantly, in each of these studies, researchers found that the accuracy of clinical notes remains consistent across documentation methods, meaning there is no significant difference between the number of errors in notes produced by typing vs. dictation. Additionally, the studies show that while speech-to-text reduces documentation time, it simultaneously increases note length. In summary,most physicians produce a longer, more detailed clinical note in less time when dictating.

Cost Saving Scenarios

In 2020, the average physician spent over 15 hours on documentation and paperwork each week.[10] Our research synthesis above shows that, when compared to typing, physicians using speech-to-text dictation increase documentation speed by roughly 36%. Assuming a conservative estimate of 10 hours spent on clinical documentation weekly, the average U.S. physician would save over 3 hours by switching to medical dictation.

What would you do if you got three hours back each week? See more patients? Go home earlier? Finish notes at the office and leave the laptop at home?

For the purpose of estimating ROI, we assume the same work-hours but also a 36% faster clinical documentation method.

What impact would this have on revenue for a typical primary care physician working at a hospital? A 36% increase in documentation speed saves roughly 45 minutes of documentation time daily, assuming 2 hours are spent each day on clinical documentation. For a PCP who sees 20 patients daily, this increase makes time for an additional 2 patient visits per day.

On average, primary care physicians generate $2,111,931 in net revenue annually for their affiliated hospitals.[11] For a PCP conducting 100 visits per week, or 5,000 visits per year, and assuming average net revenue per visit is $422, an additional 2 visits per day adds $4,220 in net revenue weekly. Over the course of a 50-week year, these additional patient visits are equivalent to $211,000 in additional hospital revenue.

Investing $149 / month in a leading speech-to-text medical dictation software...	**Could reduce documentation time enough for a PCP to see 2 additional patients per day...**	**Assuming an average net revenue of ~$400 per visit, this adds $4,000 weekly...**	**Leading to an increase of more than $200k in annual revenue.**

10 Medscape Physician Compensation Report (2020)

11 Merrit Hawkins Physician Inpatient/Outpatient Revenue Survey(2019)

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As this scenario shows, the economic impact of seeing two additional patients each day is over $20,000 annually. Leading mobile medical speech-to-text softwares like Mobius Conveyor cost $149/month, or less than $1,800/year for unlimited dictation. For the typical primary care physician who sees 20 patients a day and experiences a 36% increase in documentation time switching from typing to dictation, net revenue for the affiliated hospital increases $211,000 annually, all else equal. Based on this scenario, the return on investment of switching from typing to a speech-to-text medical dictation software is over 11,800%..

What about provider satisfaction?

Switching from typing to speech-to-text will save most physicians hundreds of hours or thousands of dollars a year. But doctors who adopt a speech-to-text workflow also report subjective benefits, including increased work satisfaction.

One 31-month study of a New York hospital followed 421 physicians and other clinicians as they switched from typing to using speech-to-text for clinical documentation. An impressive 84% of providers reported improved or optimized workflow after speech-to-text was implemented.

Researchers conducting the same study used a Net Promoter Score (NPS) methodology to ask, on a scale from 0 to 10, how likely doctors were to recommend current documentation tools versus speech-to-text to documenting in the EHR. Promoters give scores of 9-10 while detractors give 0-6. NPS subtracts detractors from promoters to calculate the net percentage of promoters, where 50+ is considered excellent. In the New York hospital study, researchers found a 99-point shift in NPS post speech-to-text implementation. They conclude that "A dramatic increase in provider satisfaction can be attributed to [speech recognition]." [12]

This connection between speech-to-text documentation workflows and provider satisfaction is consistent across the literature. Even a randomized control trial in which physicians documented the same simulated scenario using both typing and dictation found that doctors reported a better mood after documenting with assistance from speech-to-text. [13]

12 Saxena et al. (2018) "Provider Adoption of Speech Recognition and its Impact on Satisfaction, Documentation Quality, Efficiency, and Cost in an Inpatient EHR"

13 Vogel et al. (2015) "Analysis of Documentation Speed Using Web-Based Medical Speech Recognition Technology: Randomized Controlled Trial"

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Choosing Medical Speech-to-Text

This whitepaper finds that physicians who switch from typing to medical speech-to-text dictation experience an estimated 36% increase in clinical documentation speed. For the average primary care physician, this corresponds to seeing two additional patients each day and a 1,100% return on investment.

So why doesn't every physician switch to speech-to-text as the primary documentation method? One answer is that changing your workflow is hard.

Physicians who start using speech-to-text often report a transition period that initially requires extra time and effort before time and cost savings are realized. However, once a clinician has switched from typing to dictation, they rarely look back.

Dr. John Williams, M.D., F.A.C.S., is a breast cancer surgeon and national education leader who serves as Chairman of the President's Cancer Panel. Here's how he put it in an interview about his experience using Mobius Conveyor, a speech-to-text software created by Mobus MD:

"It's easier to not change because of resistance, but it's so worth the effort to flip that switch and integrate dictation because it's something you'll use forever going forward. I would bet there isn't one doctor who has used a dictation system like Dragon or Mobius and then stopped using it and returned to typing text as the modality for communicating. There's a reason no-one returns to typing from dictation, and that's because speaking is natural – it's human."

Mobius MD

THE MEDICAL WORKFLOW COMPANY

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