

# LOST DAYS AND PRODUCTIVITY IMPACT OF GOUT

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## ABSTRACT

**PURPOSE:** Determine the economic impact of gout on workplace absence, productivity while at-work, and annual productivity.

**METHODS:** We examined an employer database of more than 250,000 employees that tracked absences due to Sick-Leave (SL), Short-term and Long-term Disability (STD and LTD), and Workers' Compensation (WC) from 2001 through 2004. For employees with jobs where units-of-production are captured, we also examined real work output data. We identified gout patients with an ICD-9 for gout.

**RESULTS:** Data were available for 1,171 employees with gout and a control group of (247,867) employees without gout to explore differences in work absence. In addition, real work-output data was available for 86 gout employees and 27,472 non-gout employees. Overall, the gout employees had 4.6 more absence days per year than the non-gout employees. By type of absence, the annualized days for gout and non-gout employees were: SL days (6.3 versus 3.6;  $P < 0.0001$ ); STD days (6.2 versus 3.2,  $P = 0.0003$ ); LTD days (0.2 versus 1.7,  $P < 0.0001$ ); WC days (1.6 versus 1.4,  $P = 0.4950$ ). Analysis of at-work productivity found that average units-processed-per-hour did not vary significantly between the employees with gout and those without (17.9 versus 18.5,  $P \geq 0.05$ ). Combining absence and at-work productivity results for the subset of employees with real work-output data, employees with gout had 2.0% lower mean annual productivity output than employees without gout ( $P \geq 0.05$ ).

**CONCLUSIONS:** Significant additional employee absenteeism was seen in gout patients compared to non-gout employees. Employer-based interventions focusing on managing gout could increase employees' ability to be at-work and contribute to production.

## BACKGROUND

- Gout is thought to affect approximately 5.1 million US adults, and its prevalence is thought to be increasing due to increased risk factors.<sup>1</sup>
- The potential cost to employers of gout due to acute flares, recurrent attacks, and development of chronic complications is substantial.<sup>2</sup>
- Little research is currently available on the economic impact of gout on the workplace.

**Goal:** To evaluate the impact of gout on employers in terms of workplace absence and decreased productivity.

## METHODS

**Data Source:** The Human Capital Management Services Research Reference Database (HCMS RRD), a dataset of approximately 250,000 employees representing retail, service, manufacturing, and financial industries. Data was collected from 2001-2004 adjudicated claims, payroll, and demographics for sick leave, short-and long-term disability and workers' compensation. Index date for employees with gout was that first associated with the diagnosis (defined as an ICD-9 code of 274.xx). An average index date was assigned to the non-diseased group based on data found for the gout cohort.

**Data Analysis:** Lost time was calculated using a 2-stage regression technique controlling for age, gender, salary, tenure, exempt status, full-time/part time status, race, marital status, region (10 major Zip Code areas), and co-morbidities. At-work productivity was calculated using a generalized linear regression model, controlling for the above variables.

## RESULTS

- Data was available on 1,171 employees with gout and 247,867 employees without gout.
- Gout prevalence was 0.47%
- Employees with gout had 4.56 more sick days than those without gout.
- Employees with gout averaged 3.51% less units processed per hour than employees without gout ( $P = 0.4939$ ), and 2.02% fewer units processed per year ( $P = 0.7758$ ).

**RESULTS** TABLE 1: Employee Demographics

	EMPLOYEES WITH GOUT <sup>†</sup>		EMPLOYEES WITHOUT GOUT <sup>‡</sup>	
VARIABLE	N	MEAN	N	MEAN
Age (at index date)	1,171	45.91	247,849	40.41
Tenure (at index date)	1,171	12.79	247,867	9.73
Gender (%)	1,171		247,867	
Female (%)		15.0%		45.7%
Male (%)		85.0%		54.3%
Married (%)	1,087	66.1%	225,037	56.6%
Ethnicity:	736		170,951	
White (%)		71.7%		65.4%
Black (%)		15.5%		19.6%
Hispanic (%)		5.8%		9.7%
Exempt (%)	1,171	36.0%	247,859	29.5%
Full Time (%)	1,171	94.4%	247,867	86.6%
Annual Salary (\$)	1,145	\$61,361	244,397	\$50,314

Differences between cohorts significant ( $P < 0.05$ ) for all demographic variables

<sup>†</sup> For employees with gout, the index date is the date of the first gout Diagnosis (ICD-9 274.xx) in the study period.

<sup>‡</sup> For employees without gout, the index date is the average index date based on the group of employees with gout.

TABLE 2: Comparison of Annual Lost Days per Employee

	EMPLOYEES WITH GOUT <sup>†</sup>		EMPLOYEES WITHOUT GOUT <sup>‡</sup>		DIFFERENCE IN DAYS LOST	GOUT VS. NON-GOUT P-VALUE <sup>#</sup>
COST CATEGORY <sup>†</sup>	N	ADJUSTED MEAN DAYS LOST	N	ADJUSTED MEAN DAYS LOST		
Sick Leave	600	6.34	123,461	3.56	2.78	< 0.0001
Short-term Disability	484	6.21	102,234	3.18	3.03	0.0003
Long-term Disability	822	0.20	177,477	1.65	-1.45	< 0.0001
Workers' Compensation	1,085	1.64	224,723	1.44	0.20	0.4950
Total		14.39		9.82	4.56	

<sup>†</sup> For employees with gout, the index date is the date of the first gout diagnosis (ICD-9 274.xx) in the study period.

<sup>‡</sup> For employees without gout, the index date is the average index date based on the group of employees with gout.

<sup>#</sup> Differences are considered significant if  $P < 0.05$ .

Table 3. Productivity Comparisons of Work Processed Per Hour and Per Year

	EMPLOYEES WITH GOUT <sup>†</sup>	EMPLOYEES WITHOUT GOUT <sup>‡</sup>
<b>Productivity Output*</b>	<b>N=86</b>	<b>N=27,472</b>
Per Hour		
Mean Adjusted <sup>†</sup> units-processed-per-hour	17.85	18.50
Standard error	0.93	0.05
95% Confidence Interval	[16.03–19.67]	[18.39–18.60]
P-Value <sup>#</sup> (Gout vs. Non-Gout, Hourly)	0.4939	
Per Year		
Mean Adjusted <sup>†</sup> units processed per year	27,482	28,049
Standard error	1,963	112
95% Confidence Interval	[23,635–31,329]	[27,829–28,268]
P-Value <sup>#</sup> (Gout vs. Non-Gout, Annually)	0.7758	

<sup>†</sup> For employees with gout, the index date is the date of the first gout diagnosis (ICD-9 274.xx) in the study period.

<sup>‡</sup> For employees without gout, the index date is the average index date based on the group of employees with gout.

\* Productivity output measurements come from real worker output data. This data provides the number of units processed (units of work performed) for each employee on a daily basis. The populations in this study were restricted to those employees with productivity data. Outliers (> 4 standard deviations) were removed.

<sup>#</sup> Productivity output measurements shown are adjusted by using regression modeling and by controlling for age, tenure, gender, marital status, race, exempt status, full-time/part-time status, salary, location, and Charlson Comorbidity Index. Differences in adjusted units processed per year between employees with gout and employees without gout are statistically significant if  $P < 0.05$ .

## CONCLUSIONS

- Employees with gout have significantly greater sick leave and short-term disability than employees without gout. Using the prevalence rate of 0.47% calculated for this dataset, total annual lost days across the 64% of the US population (aged 18 years to 64 years) that are insured by an employer can be estimated at approximately 2.527 million days.<sup>3</sup>
- No significant differences were noted in productivity measures. These analyses were limited by sample size and difficulty in determining measures to evaluate this metric in "white collar" positions.
- The study suggests that further research is needed to evaluate the drivers of lost time and productivity in gout patients.
- Better management of gout may be required to improve the health and productivity status of the employee with gout.

## REFERENCES

<sup>1</sup> Kramer HM, Curhan G. Am J Kidney Dis 2002;40:37-42.

<sup>2</sup> Mikuls TR, et al. Ann Rheum Dis 2005;64:267-72.

<sup>3</sup> Kaiser State Health Facts. Or: 50 State-Comparisons-Population distribution by insurance status 2003. Available at: <http://www.statehealthfacts.org>.