序号	法规/指南名称 版本号/发布时间	所属章节	内容	分类
1	中国-《药品生产质量管理规范》2010 年修订	第八十六条	用于药品生产或检验的设备和仪器，应当有使用日志，记录内容包括使用、清洁、维护和维修情况以及日期、时间、所生产及检验的药品名称、规格和批号等。	I
		第一百七十五条	批生产记录的内容应当包括： （二）生产以及中间工序开始、结束的日期和时间	I
		第一百八十条	批包装记录的内容包括： （二）包装操作日期和时间	I
2	中国-《药品生产质量管理规范》附录：计算机化系统 2015 年	NA	NA	NA
3	中国-《药品记录与数据管理要求（试行）》 2020 年	第二十一条	采用电子记录的计算机（化）系统至少应当满足以下功能要求： （一）保证记录时间与系统时间的真实性、准确性和一致性	II
		第二十四条	对于活动的基础信息数据和通过操作、检查、核对、人工计算等行为产生的行为活动数据，应当在相关操作规程和管理制度中规定记载人员、记载时间、记载内容，以及确认与复核方法的要求。	I
4	中国-《疫苗生产检验电子化记录技术指南（试行）》 2022 年	5.4.2	电子批记录的生产部分至少要包含以下内容： b) 生产以及中间工序开启、结束的日期和时间的电子数据	I
		5.4.5	电子批包装记录至少要包含以下内容： b) 包装操作的日期和时间的电子数据	I
		8.1.3	针对自动数据采集的获取方式，应当遵循以下要求： c) 需确保准确、实时记录数据并能显示正确的时间戳，可采用时钟同步功能，接收国家标准时间。	II
		11.1.5	日期数据项类型：YYYYMMDD，符合 GB/T 7408 日期、时间数据项类型：YYYYMMDDThhmmss，符合 GB/T 7408	IV
		11.2	需记录日期及时间的数据项：清洁时间、灭菌时间、入库时间、出库时间、取样时间、投料时间、退库时间、生产开始时间、生产结束时间、工序开始时间、工序结束时间、包装操作的时间、取样时间、样品接收时间、样品检验时间、剩余样品处置时间、试剂及标准品的入库时间、领用时间、归还时间、操作时间、销毁时间、审计追踪的操作时间、电子签名时间、细胞制备步骤时间、	III
5	FDA-21 CFR Part 11 Electronic Records; Electronic Signatures 2023 年	§ 11.10	Persons who use closed systems to create, modify, maintain, or transmit electronic records shall employ procedures and controls designed to ensure the authenticity, integrity, and, when appropriate, the confidentiality of electronic records, and to ensure that the signer cannot readily repudiate the signed record as not genuine. Such procedures and controls shall include the following: (e) Use of secure, computer-generated, time-stamped audit trails to independently record the date and time of operator entries and actions that create, modify, or delete electronic records.	I
		§ 11.50	Signed electronic records shall contain information associated with the signing that clearly indicates all of the following: (2) The date and time when the signature was executed	I
6	FDA-Data Integrity and Compliance With CGMP Q&A 2018 年	NA	b. What is “metadata”? Metadata is the contextual information required to understand data. A data value is by itself meaningless without additional information about the data. Metadata is often described as data about data. Metadata is structured information that describes, explains, or otherwise makes it easier to retrieve, use, or manage data. For example, the number “23” is meaningless without metadata, such as an indication of the unit “mg.” Among other things, metadata for a particular piece of data could include a date/time stamp documenting when the data were acquired, a user ID of the person who conducted the test or analysis that generated the data, the instrument ID used to acquire the data, material status data, the material identification number, and audit trails. Data should be maintained throughout the record’s retention period with all associated metadata required to reconstruct the CGMP activity (e.g., §§ 211.188 and 211.194). The relationships between data and their metadata should be preserved in a secure and traceable manner.	I
7	EU-GMP Annex 11 Computerised Systems 2011 年	12.4	Management systems for data and for documents should be designed to record the identity of operators entering, changing, confirming or deleting data including date and time.	I
8	EU-GMP Annex 11 Concept Paper on the Revision of Annex 11 2022 年	NA	NA	NA
9	EMA-Data Integrity Q&A 2016 年	NA	NA	NA
10	EMA-Guideline on Computerised Systems and Electronic Data in Clinical Trials 2023 年	5.5	Timestamp Accurate and unambiguous date and time information given in coordinated universal time (UTC) or time and time zone (set by an external standard) should be automatically captured. Users should not be able to modify the date, time and time zone on the device used for data entry, when this information is captured by the computerised system and used as a timestamp.	II
		A5.1.1.1	System design One of the advantages of using an ePRO system is that the timestamps of data entry are recorded. The timestamp should record the time of the data entry and not only the time of the data submission/transmission. Logical checks should be in place to prevent unreasonable data changes such as 'time travel' e.g. going back (months, years in time) or forward into the future based on the protocol design.	II
11	MHRA-GXP Data Integrity Guidance and Definitions 2018 年	5.1	Systems and processes should be designed in a way that facilitates compliance with the principles of data integrity. Enablers of the desired behaviour include but are not limited to: • At the point of use, having access to appropriately controlled/synchronised clocks for recording timed events to ensure reconstruction and traceability, knowing and specifying the time zone where this data is used across multiple sites.	I
12	ICH-E6(R3)《药物临床试验质量管理规范（草案）》 2023 年	3.16.2	统计编程和数据分析 (e) 申办者应保留与试验结果报告中包含或使用的数据结果相关的统计编程记录，包括所执行的质量控制/验证活动。输出应可追溯到统计软件程序，并应注明日期和时间戳，并防止任何更改。	I
13	ISPE-GAMP5 第二版 A Risk-Based Approach to Compliant GxP Computerized Systems 2022 年	43.4.2	An ISMS (as defined by ISO 27001 [44]) should be established to define the policies, procedures, and tools to be followed to protect computerized systems data and records. Such policies and procedures include: • Control and synchronization of system clocks	II
14	WHO-TRS 1033 Annex 4 Guideline on Data Integrity 2021 年	4.15	Records (paper and electronic) should be kept in a manner that ensures compliance with the principles of this guideline. These include but are not limited to: ■ ensuring time accuracy of the system generating the record, accurately configuring and verifying time zone and time synchronisation, and restricting the ability to change dates, time zones and times for recording events; ■ ensuring the proximity of an official GxP time source to site of GxP activity and record creation.	I 、II
		Appendix 1	Example 7: Contemporaneous Personnel should record data and information at the time these are generated and acquired. For example, when a sample is weighed or prepared, the weight of the sample (date, time, name of the person, balance identification number) should be recorded at that time and not before or at a later stage. In the case of electronic data, these should be automatically date- and time-stamped. In case hybrid systems are to be used, including the use for an interim period, the potential and criticality of system breaches should be covered in the assessment with documented mitigating controls in place. (The replacement of hybrid systems should be a priority with a documented CAPA plan.) Example 11: Accuracy ■ when the activity is time-critical, printed records should display the date and time stamp.	IV
15	PDA-No.80 Data Integrity Management System for Pharmaceutical Laboratories 2018 年	6.2.1	The major risks associated with data integrity in the data governance of laboratory hybrid systems should be monitored by quality personnel on a regular basis and include, but are not limited to, the following: • Lack of controls to retain source electronic data and data that is "complete" and includes all metadata, which may be due to access to the computer clock, recycle bin, and data files in operating system files	II
		6.2.2	Results output. The results from hybrid systems (pH meters, balances, and titrators) should be printed with date-and- time stamp, raw data, metadata, measurement values, sample identity, batch number, file names, and calculated values.	IV
		6.3	Suggested controls to prevent and detect possible data integrity breaches include: Protocol that restricts users from changing the system date and time	II
		6.3.3	Qualification of laboratory instruments and any features or functionality that may compromise data should be verified, for example: • Date and time stamp function should be enabled either in the instrument or on the computer attached to the instrument, but analysts should not have the option of modifying the date and time stamp functionality	II
		6.3.11	The following problems, listed with the respective ALCS components, are often encountered and commonly found in audits or cited in FDA Warning Letters: • Computers ✓ Data acquisition date-and-time-stamp changes to alter actual date and time of results； ✓ Time synchronization across all equipment and computers in the laboratory； ✓ Altering or setting back the computer's clock or date and time of the chromatographic injection. • Data Handling ✓ Data manipulations, such as changing integration, date and time, or method parameters	II
		6.5	Laboratory data management software typically is validated using the following steps (not necessarily in this order): • Ensure PDFs of any converted data files are not editable and bear a date-and-time stamp	IV
		7.2	Risk factors for the collection, control, and verification of microbiology data are reduced with computer interface technology, such as automated plate readers or rapid methods that produce an electronic record that is retrievable and relatively tamper-proof or digitally time-and-date-stamped photography equipment. 'This can include automation and the use of advanced methods with a validated data recording (for example, ATP bioluminescence platform) system and audit trail capabilities. Even when a technological solution is not available, a strong pharmaceutical quality system (PQS), including an effective site audit program, supervisory and Quality Unit presence in the laboratory, and a robust periodic review of the documentation system, will reduce data integrity risk. On the other hand, a weak PQS increases the data integrity risk.	IV
		8.4	Any permanent changes implemented should be based upon the results of the investigation and comprehensive assessment, the resulting root cause determination, and the gap analysis. The following steps are commonly taken to prevent recurrence: • Assurance that incidents of missing data, deletion of data, and changes to time-and-date stamps has stopped and actions have been taken to prevent recurrence	II
16	PIC/S 041-1-Good Practices for Data Management and Integrity in Regulated GMP/GDP Environments 2021 年	5.5.4	Risk assessments should focus on a business process (e.g. production, QC), evaluate data flows and the methods of generating and processing data, and not just consider information technology (IT) system functionality or complexity. Factors to consider include: • outcomes of a comparison between electronic system data and manually recorded events (e.g. apparent discrepancies between analytical reports and raw-data acquisition times)	II
		8.6.1	4. Expectation Records should be signed and dated using a unique identifier that is attributable to the author. Potential risk of not meeting expectations/items to be checked • Ensure that all key entries are signed & dated, particularly if steps occur over time, i.e. not just signed at the end of the page and/or process.	I
		8.9.1	Some very simple electronic systems, e.g. balances, pH meters or simple processing equipment which do not store data, generate directly-printed paper records. These types of systems and records provide limited opportunity to influence the presentation of data by (re-)processing, changing of electronic date/time stamps. In these circumstances, the original record should be signed and dated by the person generating the record and information to ensure traceability, such as sample ID, batch number, etc. should be recorded on the record. These original records should be attached to batch processing or testing records.	IV
		9.1.5.2	In dealing with metadata, some metadata is critical in reconstruction of events, (e.g. user identification, times, critical process parameters, units of measure), and would be considered as ‘relevant metadata’ that should be fully captured and managed. However, non-critical meta-data such as system error logs or non-critical system checks may not require full capture and management where justified using risk management.	I
		9.5	- Normal users should not have access to critical aspects of the computerised system, e.g. system clocks, file deletion functions, etc. - Systems should be able to generate a list of successful and unsuccessful login attempts, including: o Date and time of the attempted login, either in local time or traceable to local time. - The operating system clock should be synchronized with the clock of connected systems and access to all clocks restricted to authorised personnel.	I 、II
		9.8	Where global systems are used, it may be necessary for date and time records to include a record of the time zone to demonstrate contemporaneous recording.	IV
17	APIC-Practical Risk-Based Guide for Managing Data Integrity 2022 年	4.1	Low severity data: CGxP Data that is CGxP relevant but is not directly associated with raw material testing, API intermediate production or testing or API final stage production or testing. Examples (not exhaustive): o Time and attendance information (time and attendance system may not be qualified, but maybe used during investigations)	IV
		4.3	For all combinations of systems, processes and CGxP data, it is necessary to challenge the following areas: • Time Stamps → Access security, Daylight savings Time, Synchronization, Time/Date format and precision, Time zone	II 、IV
		Table 2a	Detailed data integrity checklist Time Stamps-Synchronization 40. Is the system synchronized with an approved managed trusted time server (atomic clock)? (3/4/5/6) Acceptance criteria: The system shall be synchronized with a managed trusted time server (atomic clock) or when synchronization to a trusted time source is not possible: the administrator shall periodically review the audit log time source for accuracy against a trusted time server (atomic clock), with a frequency defined by risk assessment. The administrator shall correct inaccuracies in system time according to the company’s procedures. For server-based systems, the date and time shall be taken always from the server, not from (one of) the client components. All components producing time information shall be synchronized automatically with a managed trusted time server (atomic clock). Synchronization shall start at the start up of the system. 41. For paper based manual observations: do the procedures ensure to make use of an approved managed trusted clock? (1) Acceptance criteria: Procedures shall be in place to ensure the usage of an approved managed trusted clock when recording date and time notations on paper records? Time Stamps-Time and date format and precision 42. Are dates in a format that makes the day, month, and year and time zone clearly discernible? (1/2/3/4/5/6) Acceptance criteria: Dates shall be in a format that makes the day, month, and year clearly discernible. If a 12-hour format is being used to record time, “AM” or “PM” must always be included in the time recorded (e.g. 12:43 PM) for every entry. Any format of AM or PM is acceptable, e.g. AM/PM, A.M./P.M., a.m./p.m., etc. if the meaning is clear in context. Calculations shall be verified for conversion between 24- hour and 12-hour format. The time & date format chosen shall be defined and consistently used. Time Stamps-Daylight savings 43. Is the system capable of taking a daylight-saving time switch to correct for summer or winter time? (3/4/5/6) Acceptance criteria: When the system is technically not capable to take daylight-saving time switch into account automatically, specific arrangements need to be implemented and defined in a procedure for that system. These arrangements shall make sure that no CGxP data are lost or overwritten. Additional notation may be required for clarity for those two-time definitions whenever displayed or printed. Time Stamps-Access security 44. Can non-IT administrator roles change systems date and time settings (including time zone settings)? (3/4/5/6) Acceptance criteria: Only system administrators shall have sufficient authority to change systems date and time settings. Non administrator roles shall have read only access.	II 、IV
18	ECA-GMP, GCP and GDP Data Governance and Data Integrity 2022 年	5.3.1	Throughout the whole process of the creation of an analytical record or complete data for an analytical procedure there must be explicit linkage to key metadata to support data integrity criteria such as identification of: • Individual analytical personnel are uniquely identified and their actions are accurately time and date stamped • Time and date stamps on all raw data files, processed data files and the contextual metadata must be consistent and have a trustworthy storyline	I